REPORT

OF THE

MINISTER OF AGRICULTURE

FOR THE

DOMINION OF CANADA

FOR THE

YEAR ENDED OCTOBER 31

1905

PRINTED BY ORDER OF PARLIAMENT

OTTAWA
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1906

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MINISTER'S REPORT :—

REPORT

OF THE

MINISTER OF AGRICULTURE

1905

To His Excellency the Right Honourable Sir ALBERT HENRY GEORGE, EARL GREY, *Viscount Howick, Baron Grey of Howick, in the County of Northumberland, in the Peerage of the United Kingdom, and a Baronet; Knight Grand Cross of the Most Distinguished Order of Saint Michael and Saint George, &c., &c., Governor General of Canada.*

MAY IT PLEASE YOUR EXCELLENCY—

I have the honour to submit to Your Excellency the annual report of the Department of Agriculture, for the year ended October 31, 1905.

1.—GENERAL REMARKS.

A synopsis of the operations of the department, which have been efficiently carried out, is laid before Your Excellency.

The legislation affecting the department during the last session of Parliament consisted of:—

Chapter 5, 4-5 Edward VII., intituled 'An Act respecting the Census and Statistics.'

Chapter 6, 4-5 Edward VII., intituled 'An Act to amend the Census and Statistics Act.'

Chapter 21, 4-5 Edward VII., intituled 'An Act to amend the Act respecting the Incorporation of Live Stock Record Associations.'

Chapter 41, 4-5 Edward VII., intituled 'An Act to amend the Act respecting the Inspection and Sale of Seeds.'

Chapter 44, 4-5 Edward VII., intituled 'An Act to amend the Act respecting the Packing and Sale of Staple Commodities.'

Chapter 45, 4-5 Edward VII., intituled 'An Act respecting the Administration of an Act respecting the Packing and Sale of certain Staple Commodities.'

Chapter 46, 4-5 Edward VII., intituled 'An Act respecting the Superintendent of Insurance and the Director General of Public Health.'

By Order in Council of December 6, 1904, in virtue of the provisions of Section 29 of 'The Animal Contagious Diseases Act, 1903,' regulations relating to Hog Cholera and Swine Plague were made and established. Vide *Canada Gazette,* vol. xxxviii., page 1421.

By Order in Council of December 23, 1904, in virtue of the provisions of Section 29 of the Act 3 Edward VII., Chapter 11, regulations relating to Actinomycosis were made and established. Vide *Canada Gazette,* vol. xxxviii., page 1421.

By Order in Council of December 23, 1904, in virtue of the provisions of Section 29 of 'The Animal Contagious Diseases Act, 1903,' regulations respecting Tuberculosis were made and established. Vide *Canada Gazette,* vol. xxxxiii., page 1422.

By Order in Council of March 25, 1905, in virtue of the provisions of Section 29 of the Act respecting infectious or contagious diseases affecting animals, the regulations established by Order in Council of September 19, 1904, relating to a disease in animals known as glanders, were rescinded and new regulations substituted in lieu thereof. Vide *Canada Gazette,* vol. xxxviii., page 2117.

By Order in Council of March 31, 1905, in virtue of the provisions of Section 29 of the Act respecting infectious or contagious diseases affecting animals, Sections 35 to 52, inclusive (relating to Sheep Scab), of the general Order in Council of May 12, 1888, were rescinded and new regulations substituted therefor. Vide *Canada Gazette,* vol. 38, page 2116.

By Order in Council of April 12, 1905, in virtue of the provisions of the Act respecting infectious or contagious diseases affecting animals, it was ordered:—

That Section 4 of the regulations relating to animals quarantine established by the Order in Council of March 30, 1904, be amended by striking out the word 'Sidley' in the ninth line and inserting the word 'Osoyoos' in lieu thereof.

That the following section to be designated as section 4*a* be added to the regulations:—

'The Minister of Agriculture is hereby empowered to cancel as quarantine and inspection stations any of the places above named and to select such other sites in exchange for or in addition to the above as he may from time to time deem expedient.'

That the words 'other than horses' be inserted after the word 'animals' in the first line of section 5*a*. Vide *Canada Gazette,* vol. xxxviii., page 2241.

Canada's participation in International Exhibitions during the past few years has been of marked benefit in attracting the attention of both agricultural and industrial classes to the Dominion, and in this way has materially assisted immigration.

A full report of the work done in connection with the Louisiana Purchase Exposition held in St. Louis, U.S.A., from April 30 to November 30, 1904, to which reference was made in my report of last year, will be found as an appendix hereto attached.

The Exhibition Branch of my department arranged for the installation of the Experimental Farm exhibit at the Dominion Exhibition held at New Westminster, B.C., from September 27 to October 7, 1905. The exhibit consisted of the products of the western Experimental Farm. The leading feature of the exhibit was the endless variety of fruits from the Experimental Farm at Agassiz, B.C. This part of the exhibit did much to bring to the attention of visitors to the exhibition the great possibilities of British Columbia as a fruit growing country.

Since presenting my last annual report my exhibition commissioner and his staff have not been idle. It having been decided that Canada should participate in the Universal and International Exhibition which opened in Liége, Belgium, last April, and also in the Western Pennsylvania Exhibition held in Pittsburg during the months of August and September last, every effort was made to get together attractive exhibits. These efforts were most successful and the various exhibits prepared reflected credit on those to whom the work was entrusted.

The Pittsburg Exhibition attracted visitors from Ohio, Western Virginia, Maryland and Pennsylvania. This territory is considered one of the best fields in the United States for promoting immigration to Canada. Our exhibits consisted of specimens of agriculture, fruits, maple sugar, honey, cheese and food products generally. The size, prominent location and excellent arrangement of our exhibit gave it the first place among the attractions of the exhibition, and was widely advertised by the management as one of the leading features of their exhibition.

In addition to our own staff, immigration officers from the Department of the Interior were in attendance, and I am pleased to state that as a direct result of our work there, we can show where many persons have already gone to the Northwest, and that the coming spring will see a considerable influx into Canada from this territory.

Our participation in the Liége Exhibition has been most successful. We occupied a building of our own, and it is no exaggeration to state that the Canadian Palace, as it was called, received more visitors than any other section of the entire exhibition.

Our exhibits consisted of comprehensive collections of agriculture, horticulture, forestry, fish and game, mines and mining and manufactured articles. In all these departments the greatest interest was aroused, and the advertisement which resulted from the several displays was not confined alone to the visitors to the exhibition, but practically to the whole continent of Europe. Never before has a knowledge of the immense resources of Canada been disseminated among a larger number of people in the same space of time.

Descriptive literature about Canada was prepared in different languages and distributed judiciously among the visitors to the exposition.

A complete staff of immigration officers and assistants were constantly engaged in giving information to those wishing to find a home in Canada.

A complete report on this exhibition is in course of preparation, and will appear in my annual report for next year.

Until the year 1900 there was no Dominion legislation providing for the incorporation of Live Stock Record Associations. For some years previous the Holstein Friesian Association of Canada had agitated for incorporation under Dominion Act, and during the session of 1900 the Act respecting the Incorporation of Live Stock Associations (Vict. 63-64, chap. 35) was assented to.

This Act provides for the incorporation of not more than one association for each distinct breed of horses, cattle, sheep and swine, and under its provisions the following Record Associations have been granted Dominion incorporation :—

The Holstein Friesian Association of Canada.
The Dominion Shorthorn Breeders' Association.
The Clydesdale Horse Association of Canada.
The Canadian Hackney Horse Society.
The Shire Horse Association of Canada.
The Canadian Hereford Breeders' Association.
The Canadian Ayrshire Breeders' Association.
The Canadian Jersey Cattle Club.
The North American Galloway Association.
The Dominion Swine Breeders' Association.

Prior and subsequently to the passing of the Act, a number of lesser record associations for the various breeders were formed in the outlying provinces. This multiplication of records was fast becoming a source of confusion, preventing harmony among the breeders from the different sections of the Dominion, and creating a hindrance to interprovincial trade in pure bred live stock.

At the first annual convention of the Canadian National Live Stock Association, convened at Ottawa, in March of 1904, by the Dominion Live Stock Commissioner, under my direction, the unanimous wishes of the pure bred stock breeders of the Dominion were voiced in the following resolutions :—

(*a.*) That Canadian records of pure bred stock be made national in character and scope.

(*b.*) That there should not be more than one record for each breed in Canada.

(*c.*) That the records should be kept under the respective breed associations, provision being made to give proportionate representation to the breeders of each province, and that the administration of the records be conducted through the Department of Agriculture at Ottawa.

(*d.*) That the Dominion Minister of Agriculture be requested to assume the administration of the National Live Stock Records, under the Act in that behalf.

(*e.*) That the Dominion Government be respectfully requested to provide for the affixing of a proper seal to pedigree certificates, signifying their endorsation of registration.

(*f.*) That the Dominion Minister of Agriculture be urged to make provision in the estimates for a sufficient sum to provide for the administration of the national records of live stock, and representation at the meetings of breed societies from the outlying provinces of Canada.

In order to meet the wishes of this representative body, the Live Stock Commissioner, by my direction, negotiated with the individual breed societies at their annual meetings in February, of 1905, with a view to having them enter the national scheme At these several meetings it was resolved by the Canadian Ayrshire Breeders, the Clydesdale Horse Association, the Shire Horse Association of Canada, the Canadian Hereford Breeders, the Dominion Swine Breeders Association, the Dominion Shorthorn Breeders Association, the Canadian Hackney Horse Society, the Canadian Jersey Cattle Club, and the Galloway Breeders, that they at once proceed to nationalize their associations and records, and that the head offices be removed to Ottawa. Committees were named from each of these associations with power to complete arrangements.

In April of this year (1905) a joint meeting of the committees from these various associations was called at Ottawa, during the time of the second annual convention of the Canadian National Live Stock Association, when an agreement between the associations and the Department of Agriculture was submitted, and approved of and signed by the members of the committees on behalf of their respective associations.

This agreement provides that the several record associations shall continue to manage their own affairs and records, and handle their own funds under the provisions of the Act; that the office of the Registrar shall be at Ottawa, and all certificates shall be issued therefrom; that under the direction of the Minister of Agriculture, an officer set apart for the purpose shall inspect and approve all certificates, and shall thereupon affix the seal supplied by the department; that the Department of Agriculture shall supply an office heated and lighted for the use of the Registrars and other persons similarly employed, and all official stationery and blank forms, together with the regular postal messenger service.

At this joint meeting the committees from the several associations were formed into a National Record Board, with an executive Record Committee comprising one member each to represent light horses, heavy horses, beef cattle, dairy cattle, sheep and swine. The Record Board to be made up in future of committees chosen by each incorporated association at the close of their annual meeting each year; said board to deal with questions in which the societies are jointly interested. The Record Committee of this board, acting under the control of and with the approval of the National Record Board to have the powers of a managing director.

It was further decided at this meeting to appoint an accountant or chief clerk, whose duties would be to receive all moneys paid in connection with the records, and deposit them in a local bank to the credit of the several associations to which they respectively belonged; to supervise the work of the several registrars; and generally to represent and act for the executive committee of the board at Ottawa. This appointment was subsequently made.

To give effect to the plan adopted at the meeting, it was found necessary to amend the Act Respecting the Incorporation of Live Stock Record Associations, by passing the Act 4-5, Edward VII., Chapter 21. Section 5 of this Act provides for 'The exercise in conjunction with any other association or associations incorporated under this Act, of any of its powers or functions through a common officer or officers to be appointed by such associations,' Section 14 provides that the Minister of Agriculture may, through an officer of his department, approve, under the hand of that officer and the seal of his department, the certificates of registration issued by the national associations.

Arrangements have been made with the governments of New Brunswick, Nova Scotia, Quebec and the Northwest Territories, whereby the unincorporated records conducted in these provinces were closed to registration on the first day of May of this year and their records and books of registration transferred to the Dominion Department of Agriculture. These records have been merged with the National Records at Ottawa, all animals eligible for registration in the corresponding nationalized book being transferred thereto free of charge to their owners.

The several record associations named herein now conduct their business and issue certificates of registration from Ottawa, each certificate being inspected and approved by an officer appointed by the Minister before having the seal affixed thereto.

Arrangements are being completed whereby the French-Canadian Horse Breeders' Association of Canada, the French-Canadian Cattle Breeders' Association of Canada, the Canadian-Belgian Draft Horse Breeders' Association, the Canadian Guernsey Cattle Breeders' Association, and the Canadian Aberdeen Angus Association, will be incorporated under the Act in that behalf when the certificates of registration for each of these breeds will be issued from a head office at Ottawa under government endorsation, as in the case of the other records.

In my endeavour to improve the Canadian tobacco industry, I came to the conclusion that in order to materially do so it was absolutely necessary to engage an expert from outside the Dominion to instruct the growers in the best methods of cultivating and marketing this product. After much inquiry the services of Mr. Felix Charlan, an officer under the government of France, were obtained through the kindness and assistance of that government. In order that his services might be of benefit this year it was necessary that he should come to Canada at once so that he might see some of the tobacco crop prior to its being harvested, and also to observe the methods of harvesting and curing now practiced in the Dominion. Mr. Charlan has lately arrived in Canada and his services will be utilized during the coming winter. In my report for next year I shall be able to give a full account of the results of his labours.

II.—ARTS AND AGRICULTURE.

DAIRY COMMISSIONER'S BRANCH.

The work assigned to the Dairy Commissioner is carried on under four heads or divisions, viz., the 'Dairy,' 'Fruit,' 'Extension of Markets' and the 'Cold Storage' divisions. There are 'chiefs' at the head of the Fruit and Extension of Markets divisions who report to the Dairy Commissioner, and the Dairy and the Cold Storage divisions come directly under the Commissioner.

The Dairy Commissioner visited the markets of Great Britain and also some of the dairying districts of the continent of Europe during the past summer. The information thus obtained, concerning the requirements and tendencies of the trade in dairy produce, fruit, &c., will be valuable to the producers of these products, as will also be the knowledge gained concerning the manufacture of butter and cheese in those districts which now have the reputation of setting the world's standards of quality for these products. The cordial reception extended to Mr. Ruddick as a representative of the Dominion Department of Agriculture, and the prominence given to his visit by the English press are evidences of the important place which Canadian produce occupies in the old country markets.

PUBLICATIONS.

The following bulletins have been issued by the Dairy Commissioner's branch during the year. Copies will be sent to all who apply for them:—

No. 1.—List of Some British Importers of Farm Products.
No. 2.—Care of Milk for Cheese Factories.
No. 3.—Milk for Creameries.
No. 4.—A Report on Some Phases of Dairying in Denmark.
No. 5.—Improvement of Dairy Herds.
No. 6.—Chemical Investigations Relating to Dairying Undertaken in 1904.
No. 7.—List of Exporters of Some Canadian Products.

Further reference to the work of this branch will be clearer if made under the four heads or divisions.

DAIRY DIVISION.

PRODUCTION OF CHEESE AND BUTTER.

The past season was one of the most successful in the history of the Canadian dairy industry. Conditions were favourable for the production of a large quantity of milk, and high prices prevailed all summer for both butter and cheese. The quantity of cheese exported up to June 30, 1905, shows a slight falling off as compared with the previous twelve months, but the decrease is accounted for by the increase in the quantity of butter for the same period. The indications are that when the returns are complete for the season of 1905, the production of cheese will be found to be equal to that of 1904, while the increase in the quantity of butter manufactured will be something like twenty per cent over last year.

CANADIAN BUTTER AND CHEESE IN THE MARKETS OF GREAT BRITAIN.

Canadian cheese continues to hold the premier place in the markets of Great Britain. A comparatively small quantity is received from New Zealand and the United States. The consumption of cheese in England is showing some increase, owing to the better condition of Canadian cheese on arrival during the summer months. Canadian butter has made great progress in the estimation of the British importers and dealers during the past season, and a relatively higher price has been received for it than ever before. The outlook for the Canadian butter trade is exceedingly bright at present.

IMPROVED FACILITIES FOR THE HANDLING OF PERISHABLE PRODUCTS AT BRITISH PORTS.

The provision trades associations, the dock companies and other authorities at the various ports in Great Britain are moving in the direction of providing better facilities for receiving butter, cheese and other perishable products as discharged from the cold storage and cool air compartments of the steamships. Excellent arrangements have been carried out during the past year at the port of London, by means of which Canadian butter, cheese and bacon are now discharged from the steamers direct into warehouses having suitable temperatures for each product. Large sums of money have been spent in equipping these warehouses with the very best appliances for handling the goods in the most expeditious and careful manner. Movements are on foot at other ports to secure similar facilities. The improvements mentioned are already credited with having considerably increased the consumption of and improved the demand for Canadian produce during the past season.

DOMINION OF CANADA—Exports of Dairy Products—Home Production.

BUTTER.

Year.	Quantity.	Value.	To Great Britain.	To United States.	To France	To Germany.	Other Foreign Countries.	B. N. A. Provinces.	British Indies.
	Lbs.	$	$	$	$	$	$	$	$
1869	10,649,733	1,698,042	534,707	1,015,702	.....	1,496	14,870	95,777	26,986
1880	18,535,362	3,058,069	2,756,064	111,158	.....	.....	24,710	163,290	2,647
1890	1,951,585	340,131	184,105	5,059	.....	.....	29,342	119,989	1,636
1891	3,768,101	602,175	440,060	10,054	.....	20,447	24,021	101,649	5,944
1892	5,736,696	1,056,058	877,455	6,038	.....	5,160	27,207	133,770	6,428
1893	7,036,013	1,296,814	1,118,614	7,539	.....	1,175	35,042	127,412	7,032
1894	5,534,621	1,095,588	936,422	6,048	1,125	.....	25,560	109,263	14,170
1895	3,650,258	697,476	536,797	5,365	.....	267	35,028	108,439	11,580
1896	5,889,241	1,052,089	893,053	2,729	.....	9,370	34,299	105,472	7,166
1897	11,453,351	2,089,173	1,912,389	6,233	.....	8,513	33,490	115,754	12,794
1898	11,253,787	2,046,686	1,915,550	3,738	.....	17,574	31,619	51,045	27,160
1899	20,139,195	3,700,873	3,526,007	3,984	.....	12,384	41,810	74,813	41,875
1900	25,259,737	5,122,156	4,947,000	5,044	.....	7,210	43,176	66,069	53,657
1901	16,335,528	3,295,663	3,142,353	5,839	.....	.....	39,675	44,986	62,810
1902	27,855,978	5,660,541	5,459,300	41,149	.....	101	36,109	47,066	71,816
1903	34,128,944	6,954,618	6,554,014	10,225	.....	13	198,381	69,017	112,968
1904	24,568,001	4,724,155	4,400,774	6,497	14	25,644	75,014	88,422	127,790
1905	31,764,303	5,930,379	5,568,999	70,580	14,440	.....	113,650	82,387	80,323

CHEESE.

Year.	Quantity.	Value.	To Great Britain.	To United States.	To France	To Germany.	Other Foreign Countries.	B. N. A. Provinces.	British Indies.
	Lbs.	$	$	$	$	$	$	$	$
1868	6,141,570	620,543	548,574	68,784	.....	.....	891	1,594	340
1880	40,368,678	3,893,366	3,772,769	114,507	.....	.....	170	5,710	210
1890	94,260,187	9,372,212	9,349,731	6,425	.....	370	2,154	12,777	755
1891	106,202,140	9,508,800	9,481,373	13,485	.....	.....	1,954	9,104	3,884
1892	118,270,052	11,652,412	11,593,690	39,558	2	.....	2,124	12,942	4,091
1893	133,946,365	13,407,470	13,360,237	23,578	.....	.....	2,689	18,679	2,297
1894	154,977,480	15,488,191	15,439,198	9,552	.....	173	3,036	21,948	14,284
1895	146,004,650	14,253,002	14,220,505	5,058	.....	16	5,463	9,785	12,175
1896	164,689,123	13,956,571	13,924,672	10,359	299	.....	4,861	7,509	8,871
1897	164,220,699	14,676,239	14,645,850	4,486	94	24	5,365	11,954	8,457
1898	196,703,323	17,572,763	17,522,681	14,604	.....	1,428	6,889	12,784	14,377
1899	189,827,839	16,776,765	16,718,418	17,739	.....	.....	11,701	13,293	15,614
1900	185,984,430	19,856,324	19,812,670	4,836	.....	.....	8,774	16,651	13,393
1901	195,926,397	20,696,951	20,609,361	37,601	465	12	15,375	16,603	17,534
1902	200,946,401	19,686,281	19,620,239	12,038	.....	1,179	14,133	20,100	18,602
1903	229,099,925	24,712,943	24,620,004	7,779	.....	170	18,942	21,334	44,714
1904	233,980,716	24,184,566	24,099,004	5,386	44	.....	23,810	21,754	34,568
1905	215,733,259	20,300,500	20,174,211	14,182	700	364	39,696	35,171	36,176

COOL CHEESE CURING ROOMS.

The cool cheese curing rooms at Woodstock, Brockville, Cowansville and St. Hyacinthe were again operated by the department. It was considered advisable to continue this work for the sake of having a considerable quantity of cheese properly cool-cured placed on the market. Cheese coming from these rooms in fairly large quantities attract much more attention than would scattered lots from various factories. The curing rooms have now been in operation since the season of 1902, and during that period a total of 151,826 boxes of cheese have been cured at these establishments. The merchants in Great Britain are beginning to appreciate the improvement in the quality of the cool-cured cheese, and some of the largest dealers have attributed the good demand, at higher prices, which has prevailed during the past season, to the general tendency to employ lower temperatures in the handling of cheese during summer months.

The following letters, addressed to Hodgson Bros., Montreal, from Messrs. Wall & Co., Manchester, one of the largest dealers in Canadian cheese, need no comment:

'13 Greenwood St.,

'Manchester, October 24, 1905.

'Messrs. Hodgson Bros.,

'Montreal.

'Dear Sirs,—On going through cheese marked "Hollybush 20/30," with one of our most prominent customers this morning, we were much struck with the lots marked No. 23 and 26. On examining these we found that the difference between these two lots and the others appears to arise from the fact that they have been cured in a cool

room. The No. 27 also have been treated in the same way, but are much riper. Altogether these three lots of cheese stand out from the others such a long way that we thought it worth while writing you about them, and if you can impress upon makers to have all their cheese done in this way you will confer an enormous benefit on the trade. Cheese like these are a treat to handle, and it is astonishing that the old system should be continued in the face of such marked improvement.

'Yours faithfully,

'(Sgd.) WALL & CO. (MANCHESTER) LTD.'

'13 GREENWOOD ST.,

'MANCHESTER, October 26, 1905.

'MESSERS. HODGSON BROS.,
'Montreal.

'DEAR SIRS,—Further to our letter of Tuesday regarding cheese cured in a government cooling room. We have weighed these for average, and find that they gain in weight over box weights, and we think this is as it ought to be. The customer who buys them is delighted when he gets full weight, because in ordinary Canadian cheese he does not, after he has made allowance for the cloths. We are so impressed with the value and the out-turn of these cheese that we want you to do all you can to have all cheese cured in the same way. The trade would be so much more pleasant, and we believe the consumption of cheese would be increased by goods of this kind.

'Yours faithfully,

'(Sgd.) WALL & CO. (MANCHESTER) LTD.'

I am informed that a great many cheese factories, especially in Ontario, have already improved their curing rooms as a result of the illustration afforded by the operation of the government cool curing rooms.

GOVERNMENT CREAMERIES IN ALBERTA AND SASKATCHEWAN.

Creameries were operated by the Department of Agriculture, under the direct supervision of the Dairy Commissioner, during the season of 1905, at the following places in Alberta: Calgary, Olds, Tindastoll, Red Deer, Blackfalds, Lacombe, Wetaskiwin, Beaver Hills, Evarts, Earlville, Clover Bar and Innisfail.

Those operated in Saskatchewan are at: Churchbridge, Tantallon, South Qu'Appelle and Moosomin.

The output of the 'government' creameries in Alberta for the first five months of this season shows an increase of 78 per cent over the output for the corresponding months of 1904. The butter has been easily disposed of at good prices. A largely increased quantity has been shipped this year to the Orient and to the Yukon Territory. The consumption of butter in the local, British Columbian and Northern markets appears to be growing faster than the production, and the outlook for dairying in this part of the Dominion, as in other parts, is full of promise for the future.

SHIPMENTS OF BUTTER TO THE ORIENT.

The shipments of butter from the government creameries to Japan again show considerable increase, and there are indications that this market will provide an outlet for a considerable quantity of Northwest butter in the future. The trade is in its infancy, but it is growing steadily. The consumption of butter in Japan has in the past been confined largely to European residents, but the Japanese are now cultivating a taste for this article of diet and there is likely to be an increased demand in the future. The Dairy Commissioner has been instructed to foster the trade with Japan as much as possible, with a view of providing a satisfactory outlet in the future for the product of the creameries of the Northwest and British Columbia.

NOVA SCOTIA CREAMERIES.

The dairy station at Nappan has been closed. The creamery at Mabou was not in operation last season, although the promoters of this establishment hope to have it going again when the conditions are more favourable. The creamery at Scotsburn is still operated by the department.

IMPROVEMENT OF DAIRY HERDS.

A further effort has been made during the year to awaken an interest in this important matter. Individual tests of 1,352 cows in 118 herds at 7 cheese factories located in dairying centres, were conducted for thirty-day periods during the past summer. It is hoped that this preliminary work, which shows the great difference there is in the productiveness of cows of the same breed under exactly similar treatment, will result in sufficient interest being aroused to induce dairy farmers to organize for the purpose of keeping yearly records of the individual cows in their herds. There is no line of effort in connection with the whole dairy industry that offers a better field for increasing the profits from dairy farming. Bulletin No. 5 of the Dairy Commissioner's Branch, on 'The Improvement of Dairy Herds,' deals with this question, and is available for distribution. It gives a number of interesting comparative records of herds and individual cows.

OFFICIAL REFEREE OF BUTTER AND CHEESE AT MONTREAL.

Cheese and butter are frequently purchased in the country, subject to inspection at Montreal. If on inspection the purchaser finds the quality is not up to grade upon the basis of which the price was fixed, the usual course is to 'cut' the price agreed upon, and the assumption is that the so-called cut corresponds with the seriousness of the defect or defects in the quality. In order to secure an independent judgment in such cases, the official referee may be called in by either the buyer or salesman. After examination the referee makes his report in triplicate, gives one copy to the buyer, sends another to the salesman and retains the third for future reference. Naturally the referee is called in to examine only those lots that are considered by the purchaser to be under grade. The following summary of the official referee's examinations from May 1 to November 8, 1905, shows that the referee's judgment sometimes reverses that of the buyer.

	First Grade.		Second Grade.		Third Grade.		Total, All Grades.	
	Pkgs.	Lots.	Pkgs.	Lots.	Pkgs.	Lots.	Pkgs.	Lots.
Butter	440	11	14,487	354	2,020	64	16,947	429
Cheese	2,415	43	73,806	1,383	17,480	405	93,701	1,831

DAIRY CLASSES IN BRITISH COLUMBIA.

A member of the Dairy Commissioner's staff visited British Columbia during the year and conducted classes in buttermaking and allied subjects at different dairying centres. Demonstrations in buttermaking were also given at the Dominion Exhibition held at New Westminster.

COLD STORAGE DIVISION.

COLD STORAGE AND COOLED AIR ON STEAMSHIPS.

No further subsidies have been paid the steamship companies for the fitting up of steamers with cold storage or 'cooled air' space. The various steamships of the lines trading from Montreal to British ports are now provided with all of this class of accommodation that is required, and in placing new steamers on the various routes, the owners have availed themselves of the latest improvements in marine refrigeration. The cooled air service for the carriage of cheese continues to grow in favour.

The following statement gives the number of cold storage and cooled air steamers that sailed from Montreal for British ports during the season of 1905, with the combined space in cubic feet for each class of storage:—

Sailed to.	Steamers.	Cold Storage.	Cooled Air.
		Cu. Ft.	Cu. Ft.
Liverpool	10	208,117	94,710
London	14	216,358	442,670
Glasgow	9	144,708	18,000
Bristol	6	265,271	18,291
Manchester	2	16,000	.....
Total	41	850,454	573,671
Total in 1904	39	748,709	412,480
Increase	2	101,745	161,191

As these steamers will easily average 5 trips each during the season, the total available space for the season amounted to at least 4,252,270 cubic feet of cold storage and 2,868,355 cubic feet of cooled air. A number of the cold storage steamers have no cooled air space, but the available space of both kinds is sufficient to accommodate all the traffic.

THERMOGRAPHS.

Thermographs belonging to the Department of Agriculture were placed by the inspectors of the Extension of Markets Division, in chambers carrying perishable products, as follows:—

Products.	Cold Storage.	Cooled Air.	Ordinary Storage.
Butter	167		1
Cheese	1	14	4
Apples	14	4	22
Fruit (soft)	9		
Meats	1	9	
Apples and meats	2		4
Cheese and meats	3	11	
Fruit and meat	3		
Cheese and apples		4	2
Lard			1
	201	42	34

The total number of thermographs placed was 277, or 51 more than during any previous season. The thermograph records are removed from the instruments by the cargo inspectors employed by the department at the various ports in Great Britain, and at once returned to Ottawa. Photographic copies are then made, and supplied on request to the interested steamship agents or shippers, and a copy of every record is posted on the Board of Trade at Montreal.

ICED CARS FOR BUTTER.

Arrangements were again made with the various railway companies to run a regular service of iced refrigerator cars for the carriage of butter only, from May 8 to October 21, on 53 different routes to Montreal. The department guaranteed two-thirds of the earnings of a minimum car (20,000 pounds) plus $4 a car for icing. When the earnings exceeded the guarantee there was no charge against the department. If the traffic on any route exceeded one carload, the whole service on that route was held to be self-sustaining, and no claim could be made on the Department, even if the earnings of the extra cars did not reach the amount of the guarantee.

Although four new routes were established and the service was begun a week earlier and continued a week later than in previous years, the subsidies claimed under the guarantee are smaller than in 1904, owing to the increase in the traffic.

EXPERIMENTS IN COLD STORAGE CONSTRUCTION.

A series of experiments planned to secure some positive data concerning the relative value of different materials and different combinations of the same material for insulating purposes, was carried out during the past summer. The results are now being compiled for the Dairy Commissioner's report. The information will be valuable for creamery owners who have cold storage chambers to build, and for cheese factory owners desiring to provide cool curing rooms.

COLD STORAGE AT CREAMERIES.

There is constant improvement being made in the cold storage facilities at the creameries throughout the country. Buttermakers and creamery managers are beginning to realize more fully the importance of a low temperature for the keeping of butter. The Department of Agriculture continued the plan of paying a bonus of $10 to every creamery owner who constructed a cold storage according to plans and specifications furnished and who complied with certain other conditions regarding the temperature to be maintained and the quantity of butter to be manufactured. Fifty-three applications for the bonus have been received by the department during the past year.

FRUIT DIVISION.

ADMINISTRATION OF THE FRUIT MARKS ACT.

During the shipping season, from August to March, the staff of the Fruit Division is largely engaged in the enforcement of the Fruit Marks Act. The good effect of the work of the fruit inspectors is becoming very evident in the improvement in packing and grading, which is the characteristic of this year's apple trade. The large dealers have expressed their satisfaction with the working of the Act, and have come to look upon it as one of the safeguards of the trade. The only serious criticism of the Act is that it does not supply a definition for No. 2 fruit. Both dealers and growers have expressed their desire for this legal definition, but so far they have not been able to agree upon what would constitute No. 2 fruit.

From May till August the fruit inspectors visited the large producing and distributing centres for small fruits to the very great improvement in the grading and packing of these fruits for the domestic markets.

INSPECTIONS UNDER THE FRUIT MARKS ACT.

The following statistics for the year will indicate the scope of the inspection work:—

Total number of inspections	1,641
Total number of packages examined	10,798
Number of packages in lots inspected	212,348
Number of packers whose fruit was examined	811

Only 4 packers violated section 7 (over-facing) twice.

Only 11 packers violated section 6 (over-grading) more than twice.

The foregoing figures show that there has been no attempt to undertake the inspection of all fruit. There is no reason why local authorities, dealers or consumers should not prosecute in cases of violation of any of the provisions of the Act.

FRUIT MEETINGS.

During the late winter and spring months the inspectors were engaged at orchard meetings, discussing all branches of practical fruit growing, but paying special attention to the work that bore more particularly upon the enforcement of the Fruit Marks Act. Ten of these meetings were held in British Columbia, seventy-five in Ontario, forty-five in Quebec, ten in New Brunswick, sixteen in Nova Scotia and twenty-one in Prince Edward Island.

INSPECTORS' CORRESPONDENCE.

As a means of education the inspectors have carried on a very large correspondence with fruit growers whose packing and grading was susceptible of improvement.

POWER SPRAYING DEMONSTRATIONS.

These were conducted in the Annapolis valley, Nova Scotia, and were eminently successful. Unsprayed orchards in the neighbourhood have yielded a very large percentage of unmarketable apples. I am informed that every orchard sprayed by the Fruit Division, upon which we have a report, shows a most gratifying percentage of perfectly clean and sound fruit.

The demonstrations in Ontario were discontinued this year inasmuch as the provincial government undertook the work at three or four points in apple sections.

BULLETINS.

Bulletins are published from time to time dealing with special phases of the fruit growing industry.

NAMING VARIETIES.

One of the evils of the apple trade is the confusing number of varieties, and the consequent misnaming of many of them. From the fact that section 4 of the Fruit Marks Act makes it obligatory that the proper name of the variety should be indelibly marked upon the package, the Fruit Division is ready to offer every facility for naming doubtful varieties.

PACKING DEMONSTRATIONS.

Packing demonstrations were held at the Fruit, Flower and Honey Show, Toronto, as well as at many of the principal local fairs in 1904. In addition to the regular staff in connection with this work, Mr. B. T. Boies, an expert from the Coldstream ranch, Vernon, B.C., was engaged to attend meetings during the months of September and October, 1905, giving special attention to box packing for apples and pears, as well as peaches and plums in districts growing these fruits. Mr. Boies visited Prince Edward Island, Nova Scotia, New Brunswick, Quebec and Ontario.

EXPERIMENTAL SHIPMENTS.

The fruit growers of St. Catharines asked the co-operation of the Fruit Division in a series of experimental shipments of fruit to Winnipeg in iced and ventilated cars. The fruit of each car was inspected at the shipping point by a fruit inspector, and the condition of the fruit was reported by another inspector on the arrival of the car in Winnipeg. To make a still more thorough investigation an inspector accompanied one car throughout the whole journey. A most important feature of these shipments was the records of the thermographs installed by the Markets Division.

FRUIT CROP REPORTS.

The fruit crop reports were continued this year on the same lines as last year, but with a very largely increased number of correspondents. This added materially to their value and rendered them a safer basis upon which all parties interested might act. In addition to the information upon the fruit crop the Fruit Division received a vast amount of information upon the ravages of insect and fungous pests, and was able in almost every case to suggest a remedy.

PACKAGES.

Pursuant to the amendments to the Act 'respecting the packing and sale of certain staple commodities,' passed at the last session of parliament, sections 4 and 5 of this Act, which define the size of apple barrels and boxes, berry boxes and fruit baskets, were transferred to the Department of Agriculture for administration. These sections, as amended, are herewith given for general information:—

AN ACT RESPECTING THE PACKING AND SALE OF CERTAIN STAPLE COMMODITIES.

Sec. 4. All apples packed in Canada for export for sale by the barrel in closed barrels shall be packed in good and strong barrels of seasoned wood, having dimensions not less than the following, namely: twenty-six inches and one-fourth between the heads, inside measure, and a head diameter of seventeen inches, and a middle diameter of eighteen inches and one-half, representing as nearly as possible ninety-six quarts.

2. When apples, pears or quinces are sold by the barrel, as a measure of capacity, such barrel shall not be of lesser dimensions than those specified in this section.

3. Every person who offers or exposes for sale, or who packs for exportation, apples, pears or quinces by the barrel, otherwise than in accordance with the foregoing provisions of this section, shall be liable, on summary conviction, to a penalty of twenty-five cents for each barrel of apples, pears or quinces so offered or exposed for sale or packed.

4 (*a*). When apples are packed in Canada for export for sale by the box they shall be packed in good and strong boxes of seasoned wood, the inside dimensions of which shall not be less than ten inches in depth, eleven inches in width, and twenty inches in length, representing as nearly as possible two thousand two hundred cubic inches.

2. Every person who, for export, offers or exposes for sale, or packs, apples by the box otherwise than in accordance with the foregoing provisions of this section shall be

liable, on summary conviction, to a penalty of twenty-five cents for each box of apples so offered or exposed for sale or packed.

4 (*b.*) When apples are packed in boxes or barrels having trays or fillers wherein it is intended to have a separate compartment for each apple, then the provisions of sections 4 and 4 (*a*) shall not apply.

Sections 4 (*a*) and 4 (*b*) of this Act shall come into force on the first day of June, one thousand nine hundred and six.

5. Every box of berries or currants offered for sale, and every berry box manufactured and offered for sale, in Canada shall be plainly marked on the side of the box, in black letters at least half an inch square, with the word 'short,' unless it contains when level-full as nearly exactly as practicable—

(*a.*) at least four-fifths of a quart, or

(*b.*) two-fifths of a quart.

2. Every basket of fruit offered for sale in Canada, unless stamped on the side plainly in black letters at least three-quarters of an inch deep and wide, with the word 'quart' in full, preceded with the minimum number of quarts, omitting fractions, which the basket will hold when level-full, shall contain, when level-full, one or other of the following quantities:—

(*a.*) fifteen quarts or more;

(*b.*) eleven quarts, and be five and three-quarter inches deep, perpendicularly, inside measurement, as nearly exactly as practicable;

(*c.*) six and two-thirds quarts, and be four and five-eighths inches deep, perpendicularly, inside measurement, as nearly exactly as practicable; or

(*d.*) two and two-fifths quarts, as nearly exactly as practicable.

3. Every person who neglects to comply with any provision of this section, and any person who sells or offers for sale any fruit or berry boxes in contravention of this section, shall be liable, on summary conviction, to a fine of not less than twenty-five cents for each basket or box so sold or offered for sale.

4. This section shall come into effect on the first day of February, one thousand nine hundred and two.

THE EXTENSION OF MARKETS DIVISION.

During the year under review the work of the Extension of Markets Division has been continued along the lines indicated in last year's report.

HAY FOR SOUTH AFRICA.

In the month of March an order was obtained from the Imperial War Office for fourteen hundred tons of Canadian hay to be shipped to Durban, Natal. The hay was forwarded, per steamers of the Canada-South Africa line, in three shipments—the first from St. John, N.B., on April 22, and the second and third from Montreal on May 23

and June 1, respectively. There was joint inspection at the port of shipment by an officer of my department and an officer representing the War Office. The three shipments were landed at Durban in good condition and the quality of the hay has given entire satisfaction.

TRADE INQUIRIES FROM EUROPE.

Owing to the participation of my department, during the past summer, in the Universal Exposition of Liege, Belgium, numerous letters have been received by the Extension of Markets Division from firms in Belgium, Germany and other continental countries, who are desirous of establishing business relations with Canadian shippers of farm and food products. In every case these inquiries have been placed before Canadian firms concerned, and it is hoped that business satisfactory to both parties will result.

INSPECTORS AT CANADIAN PORTS.

Four cargo inspectors were again employed, for the season of navigation, at the port of Montreal, and they furnished detailed reports of the shipments of cheese, butter, eggs, bacon, fruit, poultry, &c., forwarded in 322 sailings of steamers, as follows:—

From Montreal to:

Liverpool	83	sailings.
London	87	"
Glasgow	64	"
Bristol	27	"
Manchester	22	"
Leith & Aberdeen	13	"
Cardiff	1	"
Dublin and Belfast	17	"
South African ports	8	"
Total	322	"

During the winter season of 1904-5 one cargo inspector was stationed at the port of St. John, N.B.; and from September 1 to the end of February an inspector was employed at Halifax to report on the condition, loading, &c., of Nova Scotia apples shipped from that port.

INSPECTORS AT PORTS IN GREAT BRITAIN.

As formerly, cargo inspectors, appointed by the department, were stationed throughout the year at Liverpool, Manchester, London, Bristol and Glasgow. These inspectors reported on every cargo of perishable produce received at the above named ports from Canada, thus keeping my department fully advised regarding the manner in which our cheese, butter, eggs, fruit, &c., were handled in the unloading of the steamers, the condition of these products when landed on the docks and the time that elapsed before they were removed from the docks by the consignees.

DELAY IN TAKING DELIVERY OF CANADIAN BUTTER.

Soon after the butter shipping season commenced our inspectors again reported that, at the ports of Liverpool and Glasgow, consignments of Canadian butter were frequently allowed to lie on the docks for periods ranging from 24 to 72 hours. The situation was more serious at Liverpool than at Glasgow and strong representations were therefore made to the Mersey Docks and Harbour Board (which controls the docks at Liverpool), the Liverpool Provision Trade Association and the individual importers. Statements were compiled showing the landing and delivery dates of each shipment of Canadian butter discharged at Liverpool and copies furnished to the above mentioned bodies and to the Montreal Produce Merchants Association as well. The members of the latter association were also requested to urge upon their consignees the importance of having their consignments of butter placed in cold storage with the least possible delay, once it was discharged from the steamship refrigerator chambers.

All the Canadian butter landed at Liverpool last season was not treated in this careless manner, the major portion of each shipment having been removed with commendable despatch. But the proportion that was usually allowed to remain on the quays was sufficiently large, if damaged, to affect the general reputation of Canadian butter in the Liverpool market.

In some instances these delayed deliveries were caused by the negligence of the shipper in not forwarding his shipping documents soon enough, so that the papers did not reach the consignee until after the ship carrying the butter had arrived and discharged her perishable cargo.

During the latter part of the season the removal of our butter at Liverpool was attended to with greater promptness, and I feel confident that the importers now recognize the justice of our complaint and that they themselves will press for proper cold storage accommodation on the docks, so that butter delayed there may be held at a low temperature.

At the port of London the facilities for the handling, storage and delivery of our butter are well nigh perfect, as it goes directly from the ship's refrigerators into a cold storage warehouse on the dock. Good facilities and despatch are also afforded at Avonmouth, the port of Bristol.

INSPECTION OF REFRIGERATOR CARS.

The refrigerator car service for butter was in operation from May 8 until October 21. During that period two travelling inspectors were employed to report the conditions under which butter and cheese were hauled from the factories to the railway stations, the temperature of the butter when loaded into the cars, and the condition of the cars as regards icing and cleanliness. During the season these inspectors recorded the temperatures of 1,535 packages of butter.

Two inspectors were also stationed at Montreal. They examined the iced cars containing butter and cheese as they arrived and reported on the condition and tem-

perature of the contents, as well as the condition of the cars and the quantity of ice remaining in the bunkers. The same packages of butter that had been tested at the shipping point were again tested at Montreal, in order to ascertain if the contents had become warmer or cooler during the journey. If the tests showed that the temperature of the butter had risen in transit it indicated that the service was inefficient and the matter was at once brought to the attention of the proper railway official. During the season these inspectors inspected 1,159 cars containing the following produce: 425,737 pkgs. butter, weighing 26,968,056 lbs.; 8,658 boxes cheese, weighing 600,834 lbs.; 428 cases eggs, weighing 29,250 lbs.; 188 cases meats, weighing 40,770 lbs.; 508 pkgs. lard, weighing 13,540 lbs.; 10 brls. apples, weighing 1,685 lbs. The inspectors also examined and tested the temperatures of 4,441 pkgs. of butter.

THERMOGRAPHS IN RAILWAY CARS.

From August 22 to October 18, two carloads of mixed fruits. such as peaches, plums, grapes, early apples, pears, tomatoes, &c., were forwarded each week from St. Catharines to Winnipeg and, at the request of the shippers, I instructed the Markets Division to arrange for the placing of one or more thermographs in each car so that records might be obtained of the temperature in each during transit. Thermographs were accordingly placed in eight refrigerator cars with ice, in two refrigerator cars with no ice, but with open hatches for the purpose of ventilation and in one ventilated produce car. As far as the thermograhps were concerned the experiment was completely successful, the chart from each instrument showing a legible record. This is the first time that thermographs of the ordinary type have been successfully used in railway cars during transportation.

EXPORTS OF CANADIAN FARM AND FOOD PRODUCTS.

The following comparative statement shows the value of the principal farm and food products exported from Canada (*a.*) to all countries, and (*b.*) to the United Kingdom in 1905, also the total value of imports of similar products into the United Kingdom in 1904:—

Value of some Canadian Farm Products exported in the year ended June 30, 1905.	To all Countries.	To Great Britain.	Value of Products of the same sort imported into the United Kingdom from all countries in the year ended December 31, 1904.	
	Dollars.	Dollars.		Dollars.
Butter	5,930,379	5,568,999	Butter	102,770,189
Cheese	20,300,500	20,174,211	Cheese	28,439,681
Eggs	712,866	660,610	Eggs	32,755,460
Poultry—dressed or undressed	108,333	71,868	Poultry	5,300,505
Bacon	12,194,458	12,180,817	Bacon	62,449,758
Hams	321,501	307,155	Hams	15,110,995
Pork	188,194	45,841	Pork	8,139,729
Wheat	12,386,743	9,474,870	Wheat	166,763,225
Flour	5,877,607	2,424,116	Flour	35,325,187
Oats	862,040	563,866	Oats	18,133,784
Oatmeal	641,233	587,964	Oatmeal	2,222,085
Pease	718,421	310,397	Pease	3,733,206
Barley	514,852	402,493	Barley	34,853,120
Hay	1,261,210	799,227	Hay	2,130,451
Cattle	11,338,431	11,047,092	Cattle	47,383,989
Sheep and lambs	1,400,710	708,298	Sheep	2,880,989
Apples—green or ripe	2,627,467	2,513,599	Apples—green or ripe	10,309,031
Total	77,384,945	67,841.423	Total	578,701,384

BRANCH OF THE SEED COMMISSIONER.

Prior to January 1, 1905, the work that is now carried on under the direction of the Seed Commissioner formed a division of the work of the larger organization that was under the supervision of Dr. Jas. W. Robertson, late Commissioner of Agriculture and Dairying. The operations of the seed branch have continued during the past year, mainly along two lines, (*a.*) that looking to progress in field agriculture through giving encouragement, in various ways, to the growing and selecting of seed of field crops, and (*b.*) that making for permanent improvement in the quality of the various kinds of seeds that enter into commerce.

When we consider that more than twenty millions acres of land are devoted to field crops in Canada, some idea may be formed of the enormous amount of seed required to sow this area. If, by the use of the better seed grain an increase of one bushel per acre could be made in the average yield for all Canada, the total increase in grain alone would amount to over twelve and a half million bushels.

ENCOURAGEMENT TO SEED GROWING.

Scientific observation has shown that there are in operation practically the same laws in plant growth and development as those which have been turned to good account in the improvement of live stock. Probably as much can be done by practical methods of selection to improve cultivated crops, as has been accomplished by selection on the part of live stock breeders. In the improvement of sugar beet, French and German seed growers studied the individuality of the plants, and were able after some years, to produce species which doubled the yield of sugar per acre.

Believing that an application of the same principles which proved to be effective in improving the sugar beet, the cotton plant, Indian corn and several other crops that are extensively grown, could also be adopted to advantage in the production of cereal grains, a plan was undertaken five years ago by the late Commissioner of Agriculture and Dairying in a way to demonstrate the benefits that accrue from care in the production and selection of seed wheat and oats. This educational policy has since been gradually extended and is still being pursued with singular success.

With a view to render more efficient service in the matter of seed improvement, and especially to those farmers who make seed growing a special industry in their farming operations, I authorized the appointment of five well trained men who are competent to give practical instruction in the principles of growing and selecting seeds and to inspect seeds that are offered in the trade. With this addition to the staff of the Seed Branch, I have been able to arrange so that one instructor may reside in and give his whole attention to meeting the needs of farmers in each of five districts, which, for the convenience of this work has, in the meantime, been arranged as follows: (1) Maritime provinces; (2) province of Quebec; (3) province of Ontario; (4) provinces of Manitoba and Saskatchewan, and (5) provinces of Alberta and British Columbia.

As instructors in seed growing they spend the greater part of the summer months travelling through farming districts, thus coming in direct contact with farmers, and discussing with them the principles of growing and selecting seeds, in the fields where the work is being carried on. In this way they are able to give the farmer a more definite plan to follow. They thus acquire a knowledge of the difficulties of the farmer and give him such information as may enable him to overcome them. The results thus far have been exceedingly encouraging and would indicate that, from persistent efforts to educate grain growers along these lines, we may reasonably hope for a very material increase in the yield, and improvement in the quality of field crops. There is already a large number of farmers who make a business of growing high-class seed grain in quantity. In order to provide so that selected seed may be recognized from ordinary grain, and also that farmers, who give special attention to the growing and selecting of seeds, might advance their interests by united effort, it was thought well to assist them to organize themselves into an association.

CANADIAN SEED GROWERS' ASSOCIATION.

With a view to secure greater uniformity in the methods of growing and selecting seeds and the more general recognition of the value of selected seed grain and other

seeds, as well as to having records kept of the history of selected seed, my department assisted in organizing the Canadian Seed Growers' Association which was finally accomplished in June, 1904. The Seed Commissioner was appointed secretary and was entrusted with the management of the work of this association during the first year. This enabled my department to place the association on a good working basis before the responsibility for its management was taken over by the association as an organization quite distinct from the Seed Branch. The work of the association was finally handed over at the time of their annual meeting which was held in Ottawa, June 27, 28 and 29 last. To enable the officers of the association to carry on efficient work, I have provided them with suitable office accommodation for their secretary, and given them a grant sufficient to meet their needs. This arrangement provides so that the Seed Branch may continue with the educational work and co-operate with the association without taking part in such business of the association as may seem to be conducted primarily to further the interests of its members.

GRASS AND CLOVER SEEDS.

The production of clover seed has grown to be an important industry. The census report for 1901 shows that out of a total of 138,495 bushels of clover seed produced in Canada, 133,744 bushels were produced in the province of Ontario. In the average of years, perhaps one-half of the total quantity produced is exported to foreign countries, Europe being our most important market for clover seed. The Toronto market virtually controls the world's prices for seed of alsike clover.

The growing of clover seed is a special industry that has proved to be a profitable one to the farmers of Ontario. The reason that clover seed is not more generally grown in most of the other provinces may be attributed to the fact that, in order to carry on the work successfully, a special machine is needed for threshing and hulling the seed, and on account of the comparatively high cost of such a machine, they are not used to any extent except in districts where a large acreage of clover is grown for seed. It has been fully demonstrated that a very high quality of red clover and alsike seed can be produced to advantage in all of the eastern provinces and in some of the districts in the western provinces.

Considerable injury has been done to the clover seed crop in the province of Ontario by the clover seed midge. This insect pest has been less prevalent this year, however, than during the season of 1904. Farmers are evidently becoming better acquainted with its habits and are adjusting their clover crops in a way to combat it most effectively.

Of the grass seeds sown in Canada, timothy seed in particular is produced to a considerable extent in all of the provinces. This seed is quite extensively grown in the Georgian Bay district and in the Ottawa and St. Lawrence valleys. It is said that the best quality of timothy seed produced in the world is obtained from these two districts.

One of the principal drawbacks to the seed growing industry in Canada is the prevalence of noxious weeds which seem to have spread from farm to farm and from

province to province with alarming rapidity during the last decade. This condition of affairs has been constantly before me, and has been many times brought to my attention by farmers and their associations in all parts of Canada. The problem of dealing effectively with this growing evil is a most difficult one. It was felt that the trade in agricultural seeds—particularly that of grasses and clovers—was very largely responsible for the spread of noxious weeds, and the investigation work that has been conducted during the last four years clearly proves this contention to be correct. Believing that the true basis for the permanent improvement of these conditions was in educating seed growers to the importance of growing pure seed and in demonstrating to purchasers of seed that clean seed is always the cheapest, I authorized the Seed Commissioner to make ample provision for having this educational work carried out in the most effective manner.

During the early spring, arrangements were made to hold four series of farmers meetings throughout the districts where grass and clover seeds are most largely grown in the provinces of Ontario and Quebec. In carrying out this work the Seed Commissioner secured the co-operation of the Provincial Departments of Agriculture through their Farmers' Institute systems. All of the meetings were held between June 8 and 26, and in the fields of grasses and clovers that were being grown for seed. Farmers were invited to bring specimens of weeds with them for identification. Each delegation was made up of one practical farmer who had had long experience in seed growing, one expert on weed and insect pests and, at most of the meetings seedsmen were present and invited to address the farmers from their standpoint. On account of the meetings being held in the fields and at the time of the year when weed growth and insect pests were most in evidence, the information given was exceedingly practical throughout and very interesting and instructive to the farmers who attended. I hope to have this educational work continued. The subjects discussed at the meetings were taken up in the following order:—

(*a*) The best methods of producing pure, strong seeds of clover, timothy and alsike, with special reference to the preparation of seed bed and quality of seed used.

(*b*) Some of the weeds commonly found in grass and clover fields, and the practical means of eradicating them.

(*c*) The marketing of pure commercial seeds.

(*d*) How to avoid the clover seed midge.

(*e*) Object of the Bill (No. 7) respecting the Inspection and Sale of Seeds.

SEED FAIRS.

Assistance has been given again this year with the holding of fifteen seed fairs, most of which were organized three years ago in the eastern provinces. They are held during the winter and early spring months and arranged in series so that the deputation of judges and lecturers supplied by my department may attend a number of them without unnecessary delays. The providing of a short course of demonstration lectures was an additional feature, arranged for a number of them during the past season, and proved to be of special interest to farmers. The advantages to farmers in having these seed fairs held annually has been fully demonstrated, and

I have been pleased to have the Seed Branch render the agricultural societies, under whose auspices they are usually held, assistance to make them useful from an educational standpoint. In giving this assistance, however, and in organizing seed fairs in localities where they have not been held, regulations to govern exhibits of seed that may be competing for prizes are recommended so that all of the seed fairs may be conducted according to uniform regulations. In localities where they have been held for three or four years there has been a notable improvement in the quality of the seed grain and other seeds exhibited and offered for sale.

Arrangements have been made for the organization of a large number of seed fairs in the grain growing districts of the west. The extension of this work in the western provinces seems to be meeting with much favour. These fairs will provide for an exhibition of seed grain after the work of harvesting the crop is completed. The officers of western agricultural societies have, for several years, felt the need of providing for such an exhibition at an opportune time in as much as their summer shows are held before the grain crop is ripened and the exhibits of grain at these shows have, as a rule, been very small.

In addition to giving assistance with the cost of advertising and providing expert judges and demonstration lecturers to attend seed fairs in the western provinces, I have authorized the Seed Commissioner to submit a plan to the agricultural societies according to which they may be given assistance with the awarding of prizes for fields of standing grain to be judged directly before the crop is harvested and from the standpoint of utility for seed purposes. I am hopeful that this plan will be generally adopted throughout the west as a means whereby the agricultural societies may give further encouragement to farmers who give special attention to the growing of high class field crops of varieties possessing the greatest commercial value, and who exercise care in preventing the introduction and spread of noxious weeds over their farms.

SEED LABORATORY.

The Seed Laboratory was established three years ago, primarily for the purpose of conducting the work of investigation into the condition of the trade in agricultural seeds. This work has been carried on with unusual vigour and the results of the work have been given the greatest possible publicity through the agricultural press, circulars to farmers' institute lecturers, and in bulletins and reports. The Seed Laboratory has since been fitted up with the very latest improved apparatus for testing the purity and vitality of seeds of all kinds and, perhaps because of being able to render prompt and efficient service, a large number of samples of seeds have been received for analysis from farmers and seed merchants who desire definite information regarding their purity and germination qualities. Many inquiries were received from seed merchants as to privileges that might be given them in the matter of having this work done and in April, I authorized the issue of a circular letter to seed merchants in Canada stating that they might have their seed tested in the Seed Laboratory free of charge. A large number of seedsmen and seed vendors took advantage of this offer. The work was done for them and reports rendered as promptly as pos-

sible. An addition of two assistants was made to the staff in order to add to the promptness and efficiency of the work. In this connection it is gratifying to note that, as the importance and value of the work of seed testing become better known by the people, more general use is made of the service offered. The importance of the work was very clearly demonstrated to the farmers through the dissemination of information as to the results of investigation work. This seemed to be a revelation to farmers in all parts of Canada inasmuch as it was shown that the trade in grass and clover seeds was a fruitful medium for the introduction and spread of extremely noxious weeds.

The interest that was noted last year on the part of farmers to use a better class of seeds is strongly in evidence again this year; seedsmen report that there has been an increasing demand for high grade seed. There are, however, some farmers, more especially those on rented farms and those who live remote from the leading trade centres, who have not come fully to appreciate the far-reaching evils that follow the use of inferior seed. The samples obtained by direct purchase from seed vendors in all parts of Canada for investigation work, show that in a few of the districts that have not, perhaps, had the full benefit of the educational propaganda that has been carried on during the last three years, a limited quantity of very low class seed is still in demand.

During the year ending October 31, 1347 samples of seed have been tested for purity and vitality; 730 of these were obtained and analysed for the purpose of investigation. 617 samples were tested for either purity or vitality, or for both, and reported upon to farmers and seed merchants. Compared with last year there has been a marked improvement in the quality, especially in respect to weed seeds, of the seeds tested for both farmers and seed merchants. In the districts where grass and clover seeds are most largely produced a much greater interest seems to be taken in the work of seed testing, and it is from these districts that the greatest number of samples are received from farmers.

The work of conducting germination tests of samples of seed corn and root crop seed shows a decided increase over the previous years. The increase in the number of samples of these two kinds of seeds that were received from farmers for germination test is probably due to the partial failure with corn, and root crops, which was in many instances attributed to nonvital seeds. Much of the seed corn sold to farmers last spring had been seriously injured by frost and damp and a great deal of it would not germinate more than fifty per cent. With root crop seeds it is well known that in some years considerable quantities of imported stocks are held over from year to year and there is evidence that old and non-vital seed has occasionally been mixed with the fresh article. On the average, however, it may correctly be said that the root crop and garden vegetables seeds retailed to farmers by Canadian seed merchants of good standing, show a reasonably good per cent of vital seeds. Comparatively few samples of root crop seeds have been found to be extremely low in vitality.

SEED CONTROL ACT, 1905.

I wish to gratefully acknowledge the support I received in Parliament in my endeavour to perfect and pass an Act respecting the inspection and sale of seeds. This Act came into force on the first of September. The main provisions of the Act demand that seed merchants place the names of certain noxious weeds, plainly written, on a label and attach it to the bag or bin when the seeds of such weeds are present in the seed offered for sale.

Section 4.—Provides a standard of quality in respect to both purity and vitality of timothy, alsike and red clover seeds that are represented to be of first quality.

Section 6.—Provides a minimum standard of purity below which timothy, alsike, and red clover seeds cannot be sold for seeding in Canada. This standard is based on the proportion of seeds of weeds named in the Act to the pure seeds of the kind sold or offered for sale.

Sellers of seeds are justly protected against negligent or evilly disposed seed purchasers. In case of dispute between purchaser and seller, prosecution can be made only when a representative sample of the seed in question has been submitted and tested by an official seed analyst, and such sample must be taken and inclosed in a sealed package, either in the presence of the seller, or in the presence of two non-interested witnesses within seven days after the sale of the seeds.

The effect of this Act thus far, has been largely confined to the districts where grass and clover seeds are grown. Farmers who have clean seed are, this year, getting from fifty cents to one dollar per bushel more for it than are the farmers who have allowed their fields to become polluted with pestiferous weeds. In general, farmers have been more careful during the past season than during previous years in not harvesting for seed purposes crops of clover from fields that are seriously polluted with noxious weeds. It was learned, too, that considerable attention was given to weeding the fields before the clover seed crop was cut. Seedsmen are adjusting and making further additions to their seed cleaning machinery. It has been stated by several of them that with the apparatus they now have, noxious weed seeds can be practically all cleaned from the seeds produced by farmers. The chief drawback to this work is that the process of special cleaning is necessarily slow and has, hitherto, been considered impracticable in the larger seed houses.

REFERENCE COLLECTIONS OF SEED.

In order to assist seed merchants in their endeavour to carry on their work intelligently the Seed Branch undertook to supply them, at a nominal cost, with collections containing 100 species of weed seeds and other economic seeds. With the use of these specimens of seeds for reference, seed vendors are able to identify the impurities in the seeds they sell. There has been a growing demand this year for these collections.

PUBLICATIONS.

In connection with the special campaign carried on by the Seed Branch, much information has been obtained that would indicate that farmers in most districts are not familiar with many of the common weeds in the immediate locality where they live. When new and seriously noxious weeds are introduced into their locality they usually become well established before they are recognized as a dangerous pest. Farmers have not had the means at their immediate disposal to identify them and to study their habits of growth and methods of combatting them. It has been felt that this lack of knowledge of the weeds themselves has, to a certain extent, hampered other general educational work along similar lines, and in order to overcome this difficulty, I have authorized the preparation of a bulletin to treat specially with weeds, and in which fifty of the worst Canadian weeds and their seeds will be illustrated in their natural colour. The text that will accompany these illustrations is being prepared with the object of giving information to farmers regarding the habits of these weeds and the best methods of combatting and exterminating them. My department has felt the need for such a publication for several years, and although the expense that will have to be incurred in connection with the preparation and printing of coloured illustrations may be too great to justify me in distributing them free of charge, I have directed that the matter contained therein be prepared in a complete and comprehensive manner.

Bulletin No. S. 1., of the Seed Branch series, contains a reprint of the Seed Control Act, together with general explanations and instructions, and the rules and methods for taking samples of seeds and testing them for purity and vitality. Fifty thousand of these bulletins were printed and have been generally distributed among farmers and seed merchants in all the provinces.

THE LIVE STOCK BRANCH.

An outline of the work accomplished by the Live Stock Branch during the year ended October 31, 1905, is given by provinces, as follows :

British Columbia.

In the spring of 1905 two members of the staff were sent to British Columbia to assist the provincial Department of Agriculture in institute work. The districts visited were those considered most in need of help. The subjects taken up were chiefly relative to fruit growing, road-making and animal husbandry. A large number of meetings were held, and as a rule well attended. Keen interest was shown in the addresses which invariably elicited lively discussions.

In these districts beef raising is the general industry with here and there a dairy farm. Hogs and sheep are also raised on a limited scale chiefly for local consumption. In the Nicola Lake district especially, the cattle raisers have made good progress and judging from their herds they have high ideals regarding the beef type. The cattle raised are chiefly Shorthorn grades and Hereford grades, brought up to the present

standard by the use of pure bred sires, but here, as well as in some other districts visited, there are evidences of faulty methods in breeding and feeding. Many of the ranchers keep sires too long in their herds, resulting in much inbreeding and breeding from immature females. Cross-breeding is also resorted to where it would have been better to have adhered to one breed. The faulty methods in feeding are confined chiefly to a lack of provision for sufficient winter supplies of fodder. The delegates dwelt especially on the importance of remedying these evils.

The sheep as a rule are of very indifferent quality and in only a few cases are breeders improving or increasing their stock, although many districts are admirably adapted to the industry.

Here and there the farmers are raising improved classes of horses. The brisk demand that exists, especially at the coast, would seem to warrant an increased attention to this branch of stock-raising.

In September, Mr. F. M. Logan was sent to British Columbia for the purpose of acquiring an insight into conditions affecting live stock in the province. Mr. Logan is acting in conjunction with the provincial Department of Agriculture.

At the instance of this branch, Mr. Geo. H. Greig, a member of this staff resident in Winnipeg, induced Manitoba breeders to exhibit at the Dominion exhibiton held at New Westminster. The breeders responded by sending six carloads of their animals, which made a marked impression on the live stock exhibit at the fair.

Northwest Territories.

Acting in conjunction with the Department of Agriculture of the Northwest Territories, a vigorous policy of agricultural education has been followed in assisting the territorial farmers' institutes, live stock and fair associations.

Representatives of the division assisted in farmers' institute work, the holding of live stock judging classes, fat stock shows, a bull sale and spring stallion shows at Calgary and Regina, and stock and poultry judging at the fairs during the summer and fall.

The series of institute meetings during the winter and spring extended over a wide range of country, touching the chief agricultural settlements of the Territories. At the meetings live stock judging was a prominent feature. Live animals and poultry were used for demonstration purposes, and those in conjunction with score cards distributed throughout the audiences did much to fix in the minds of hearers the desirable and undesirable types. A similar series of meetings was conducted by a member of the branch in July at points not touched during the earlier campaign.

At poultry shows held at Edmonton and at Lethbridge the awards were placed by a member of the staff who also delivered public addresses on poultry raising, fattening and marketing.

A fat stock show was held at Regina, a fat stock show and bull sale at Calgary, and a spring horse show at each of these places. The fat stock shows were of four

days' duration and were conducted along the same lines as the winter fairs held at Guelph, Ont., and Amherst, N.S. All the judging was done by representatives of the branch. At all these shows live stock judging schools were a feature.

At the Calgary sale, which was the fifth annual, 340 pure-bred animals were disposed of, netting $23,557. The animals were Shorthorns, Herefords, Galloways and Aberdeen Angus. Since the inauguration of these sales, 1,185 animals have been sold for over $105,000. A marked improvement in the quality of the cattle stock of the Territories has been the result of this exchange of pure bred sires, and the educational work done at the gatherings.

The horse shows were decidedly successful; the quality of the exhibits indicate that the horse stock of the Territories is of a fairly high quality. A number of the stallions compared favourably with the best shown at any other fair in Canada. This was particularly true in the draught section at Calgary.

Substatial assistance was given the fair association in the summer and fall exhibitions by the division furnishing expert judges where requested.

Manitoba.

During the year, Mr. Geo. H. Greig, of Winnipeg, the representative of this branch in Manitoba, conducted live stock conventions and judging schools throughout the province.

During the winter live stock conventions were held at Winnipeg, Neepawa and Brandon. The Winnipeg convention occupied a full week and included the annual meetings of all live stock associations and the dairy associations of Manitoba. There were also held special meetings of the Shorthorn Breeders of Manitoba and the Aberdeen-Angus breeders of Western Canada for the purpose of assisting in the nationalization of the live stock records.

The convention at Neepawa was held in connection with a winter fat stock show, held under the auspices of the Northwestern Agriculture and Arts Association. At Brandon the convention was conducted in co-operation with the Western Agricultural and Arts Association. Stock judging was made a prominent feature at all of these meetings. Representative animals of the various classes and breeds of live stock were secured from breeders and owners for demonstration purposes.

At Winnipeg a new feature was introduced for the first time. This consisted of a practical demonstration in meat cutting and was conducted under the supervision of Prof. Boss, of the Minnesota Agricultural College.

It is gratifying to know that live stock judging has become so widely appreciated that the Department of Agriculture in Manitoba and the western provinces have during the year introduced it very generally into their farmers' institute work. The men available for carrying on this work are found among those who have received their training at the stock judging schools conducted by this branch.

A provincial auction sale was organized for the distribution of surplus stock. The sale was held at Winnipeg, May 31, in the pavilion of the Canadian Pacific railway. The animals disposed of included 5 Aberdeen-Angus, which sold at an average price of $66 per head; 5 Herefords at an average of $74. 46 Shorthorns at an average of $90. In connection with this sale a competitive exhibit of the animals was held and proved a most interesting feature.

Early in May the remount officers of the British army who were on their way west were interviewed regarding the prospects of Manitoba supplying remounts for the British army. The attention of the directors of the Horse Breeders' Association was drawn to this matter and through them a number of horses were collected for inspection, but owing to the active local demand sufficient animals to make a shipment were not available and so far no business has been done. The Dominion Exhibition being held at New Westminster, B.C., the stock breeders of the province were induced to contribute, and as a result six car loads were sent, consisting of various classes of horses, Shorthorn, Hereford and Holstein cattle; Yorkshire, Tamworth and Berkshire hogs. The total amount won in prize money was $1,544.

Ontario.

In the province of Ontario the system of farmers' institutes, the improvement of fairs and co-operative auction sales of improved stock are so well established under the provincial Department of Agriculture that but little assistance is required from this branch. In New Ontario only was new work undertaken. At North Bay a sale of pure-bred stock was held in April, this branch co-operating with the North Bay Board of Trade and town council and the District of Nipissing Agricultural Society. At this sale twenty pure-bred Shorthorns, including fourteen bulls and six heifers, also twenty pure-bred Yorkshire swine were sold. The males were distributed chiefly among the farmers' clubs of the district. All the animals were carefully selected by a representative of the branch, and sold at an average price of $70 per head for the cattle and $9 per head for the swine. Preparation is being made to assist in the holding of a similar sale at North Bay during the coming spring.

A corps of institute lecturers was placed at the disposal of the Ontario Superintendent of Institutes and assisted at the regular series of meetings.

Fair improvement work has been continued at a circuit of exhibitions in the eastern portion of the province; representatives of the branch attended these fairs and conducted judging competitions in the various classes of live stock, in some cases judging all the animals shown. Instructive addresses were delivered by our men at all of these competitions.

The Guelph and Ottawa winter fairs were assisted as in previous years to develop their educational features as much as possible, speakers and judges being supplied and addresses delivered on the desirable and undesirable points of the animals under consideration.

This year as last, instruction by means of illustration plots has been carried on at Richmond and Whitby exhibitions, a representative of the branch assisting the boards with the laying out and cultivation of same.

Quebec

During January and February, a series of fifty-eight one-day meetings was conducted in the province. Each of these consisted of an afternoon and evening session. The same organization found satisfactory during 1904 was continued, viz.:—the division of the province into three French and one English section. The three French sections comprised as nearly as possible all of the French speaking counties, and the division was made according to climatic conditions; the English section covered the districts where English communities were found. Fourteen representatives were sent out, and these were divided into four delegations; three delegations made up of speakers for the purely French divisions and one delegation of two men for the English division. Before commencing this work the representatives met at Ottawa to receive instruction. The attendance at these meetings varied from 25 to 525.

Concurrent with these regular institute meetings a stock judging school was held at five points in the province. For this purpose a car load of typical animals of various breeds was taken to the meetings including light and heavy horses, dairy and beef cattle, long woolled and short woolled sheep, bacon hogs and utility poultry. At each point a two-days' judging school was held, three sessions per day. Ste. Therese, Cowansville, St. Hyacinthe, Three Rivers and Quebec were the points fixed upon for this school, and a delegation of experts accompanied the car, the audiences being addressed in both French and English. Score cards, supplied by the branch and printed in both languages, were distributed, and the meetings conducted as regular stock instruction classes. The keenest interest was manifested; the attendance ranged from 150 to 700 persons.

Expert judges were sent to five points in the province in September and October, viz.:—Sherbrooke, Waterloo, Ayers' Flats, Shawville and Brome. In judging the live stock classes our judges followed their usual custom of delivering addresses at the ring side giving reasons for the placing of the awards.

At the Sherbrooke and Brome exhibitions judging competitions were conducted. At Brome dairy cattle were used for this purpose, but at the former place, beef cattle, dairy cattle, sheep and swine were utilized, addresses being delivered on each class.

At Brome, as in 1904, instruction by means of illustration plots was carried on. A portion of the exhibition grounds was set apart for this purpose and was divided into three ranges, these being again subdivided into plots 12 x 15 feet. This ground was carefully prepared and crops suitable to the locality sown. Grasses, clovers, corn, millets and roots were grown, some of the varieties being but little known in the district. Placards were placed on each plot giving all necessary information as to the crop thereon. The crops on all the plots were exceedingly good and much interest was taken by the exhibition visitors.

NEW BRUNSWICK.

At different periods representatives of the branch have been sent to New Brunswick to assist the provincial Department of Agriculture in farmers' institute work. During October and November of this year, three delegates have conducted a series of one hundred and twenty meetings. The attendance at these averaged 43, and our men report that their audiences seemed deeply interested in the various subjects under discussion.

In January, assistance was rendered the Farmers' and Dairymens' Association of the province at their annual convention.

A stock judging school was conducted at five points in the province in June, viz.: Andover, Woodstock, Lower Jemseg, Petitcodiac and Chatham. At these places a carload of improved stock was used for demonstration purposes. The school was well attended at each point and keen interest taken in both the addresses and the scoring of the animals.

Expert judges were furnished for the exhibitions at Fredericton and Sussex. All the live stock classes were judged and the judges where possible, delivered addresses in the ring, giving reasons for their decisions.

NOVA SCOTIA.

In the province of Nova Scotia the work of this branch has been of a somewhat varied character, special attention being paid to the further development of the maritime winter fair, while the annual auction sale of pure bred live stock, the farmers' institute work and the improvement of fairs by the expert judge system at the provincial exhibition have received due attention.

The annual maritime winter fair was held December 12 to 15, 1904, at Amherst. It was a pronounced success from every standpoint, the quality of the exhibits being of a much higher order than in previous years. During the fair evening sessions were addressed by the judges and other expert agriculturists, the attendance at these daily meetings averaging from twelve to fifteen hundred.

For the approaching fair in December of this year, Mr. E. B. Elderkin, the representative of the branch in the maritime provinces, is carrying on a vigorous system of preparation, and all indications point to a very successful outcome.

The second annual auction sale of pure bred live stock was held at Amherst on February 3. At this sale 16 animals were sold, comprising 6 Shorthorn males, 7 Shorthorn females, and 3 Ayrshire males. Of these the Shorthorns averaged $60 per head, and the Ayrshires $34 per head. The stock ranged from fair to good quality. The offering of animals was much smaller than had been intended owing to the impassable condition of the railways and roads; for the same reason the attendance was below what it should have been. These conditions, coupled with an impending feed famine in the province, are in large measure responsible for the comparatively low prices.

During June and July a series of farmers' institute meetings were held throughout the province at 53 points. For each of these meetings delegates were supplied. In many of the districts visited, agriculture was found to be in a very backward condition. While much of the land is rough and unfit for cultivation, the conditions are favourable for sheep raising, and instruction was given relating to this industry. As a rule the cattle and hogs raised are indifferent to poor in quality, and the delegates endeavoured to impart such information as would improve the various defects. In a few cases open air meetings were held, and at these live animals were used for demonstration purposes. The meetings were invariably well attended, but the open air demonstrations were found to increase the interest very materially.

Expert judges were supplied by the branch to the provincial exhibition at Halifax. As on previous occasions the judging was supplemented by addresses at the ring side, the judges giving reasons for the placing of the awards, which met with very general satisfaction. The interest in this educational work was sustained during the exhibition by evening sessions held in a pavilion provided by the exhibition association. At these live stock and kindred subjects were discussed by the judges and other agriculturists. This is the third occasion on which the judging at Halifax has been done by experts supplied by this branch, and the quality of the animals offered at the exhibition of 1905 would tend to show that the work is bearing fruit.

PRINCE EDWARD ISLAND.

With the co-operation of this branch the Department of Agriculture for Prince Edward Island has been able to carry out a progressive scheme of educational work along agricultural lines. In addition to the work undertaken in previous years, several new features have been introduced, among these being the organization of a regular institute staff; the institution of semi-annual farmers' conventions, the formation of live stock judging schools, and the collection of live stock statistics.

During June and July a series of farmers' institute meetings was held. The province was divided into two districts, and a representative of this branch accompanied each delegation. Thirty one-day meetings were held, an afternoon and evening session constituting the work each day.

Many of the afternoon sessions were conducted as stock judging schools, live animals being used for the purpose and score cards provided by this branch being distributed among the audience.

This stock judging work has been so well received by the island people that preparations are under way to hold a regular judging school at Charlottetown in December of this year, immediately following the maritime winter fair at Amherst.

As a result of the teachings of this series of institutes a number of farmers have introduced a system of rotation of crops; the keeping of milk records for individual cows; and experimental work in crop growing on the co-operative plan. Statistics as to milk production in the province have been secured, and the figures show the yield per cow to be much lower than it should be ; a strong effort is being made by our

delegates to awaken the farmers to the necessity of keeping these milk records in order that they may intelligently weed out the inferior specimens.

The attendance was very good throughout, averaging about 75 per meeting.

Along the line of live stock improvement a better system of introducing improved blood had been instituted.

In April the annual farmers' convention was held at Charlottetown. Through the interest created by the work of the representatives of this branch, it was then decided to make this convention semi-annual instead of annual, and in accordance a convention is being arranged for December of this year.

Expert judges were supplied to the provincial exhibition held at Charlottetown. All the live stock classes were judged as usual, and as usual the addresses of the judges at the ring side on the placing of the awards was made a feature. Here as at Halifax evening sessions were held and at all these meetings much interest was shown, and lively discussions followed each address.

CANADIAN NATIONAL LIVE STOCK RECORDS.

An important work accomplished during the year was the nationalizing of the Canadian live stock records. Hitherto numerous records had been kept in the various provinces, varied to some extent in standard and in their method of administration, involving increasing confusion. At a national convention of live stock breeders held in 1904 a resolution was passed favouring the nationalization of all records for pure bred stock kept in Canada, and asking the department to take the necessary steps to bring it about. Between that time and the second annual convention, held in Ottawa in April, 1905, most of the record associations had agreed to nationalize. At this latter meeting representatives from the different provinces and record associations were met by the Hon. Minister and Deputy Minister of Agriculture for Canada and an agreement made, forming a basis upon which the nationalized records shall be conducted. Agreements, varying slightly to suit conditions were drafted; these were signed by the Hon. Minister of Agriculture on the one side, and the various incorporated live stock record associations, representatives of provinces, and parties controlling records in Canada on the other.

These agreements provided that all nationalized records be removed to Ottawa, where they would still be conducted independent of the Dominion Department of Agriculture by a record association for each breed; that the record certificates before being issued be submitted to an officer of the Department of Agriculture who shall affix the seal of the department to each certificate found correct. At the session of parliament for this year an Act to amend the Act Respecting the Incorporation of Live Stock Record Associations became law, and since that time all pedigree certificates issued by the national records have been uniform in style and have borne the seal of the Department of Agriculture. The following is a list of the breeds of stock that have, thus far, agreed to nationalize their records: Shorthorn, Hereford, Aberdeen Angus, Galloway, Jersey, Guernsey, French-Canadian and Ayrshire cattle; Clydesdale,

Shire, Belgian Draft, French-Canadian and Hackney horses, and the various breeds of sheep and swine.

EXTENSION OF TRADE IN LIVE STOCK.

During the year consignments of live stock were purchased and shipped to the Director of Agriculture for the Orange River Colony, South Africa, and to the Board of Agriculture, British Guiana, South America.

POULTRY DIVISION.

How the work is conducted.—The work of the division is carried on through poultry illustration stations, of which there have been three classes, fatting, rearing and breeding.

Eleven fatting stations were operated in 1904. Good thrifty cockerels were bought from the farmers, fed in crates until fat, dressed and marketed.

At the two rearing stations eggs from good Barred Rock hens are bought. The best of the cockerels and pullets reared are sold for breeding, the remainder fattened and sold dressed.

The five breeding stations are operated the year round. One hundred laying hens are kept, eggs and breeding stock are sold, and seasonable illustration work is carried on.

Present equipment.—In January, 1905, the 11 fatting stations were discontinued; the equipment was allowed to remain for the present in order that the manager might carry on the work either for himself or co-operatively. Every encouragement was given farmers in the locality to fatten their own birds. Fattening crates were loaned them and instruction given, as well as help in marketing their produce.

Seven stations are operated by the division this year, two rearing and five breeding. Two incubators are kept at the rearing stations and brooders and colony houses to accommodate the chickens incubated. The equipment of a breeding station consists of a poultry house suitable to accommodate 100 breeding hens, an incubator and plucking room, a rough fatting shed where the feeding crates are situated, two to four incubators, and a number of brooders and colony houses for rearing operations.

The year's work.—The work carried on at the stations is illustrative along commercial lines. Successful experiments are carried to the farmer and he is shown how best to apply them to his own conditions. The demand for pure-bred eggs for hatching could not be supplied. A large number of cockerels and pullets have been sold from the various stations and the average farm flock in the districts is thereby being improved. Special attention is directed to a number of features in connection with the year's work.

Utility fowl.—A good year-round producer might be called a utility bird—one that will lay eggs when prices are high; and eggs that will produce chicks of a good con-

stitution. It is such a type of farmer's fowl that the poultry division is endeavouring to produce. Each year only the most promising pullets are retained for the breeding pens, and in order to improve the laying qualities of the flock trap nests are used.

Trap nests enable breeders to keep individual records of the hens. There are a number of effective trap nests so simple in construction that any one can make them. A full description of the two styles used by the division is given in Bulletin No. 7. An instance of the interesting facts brought out by the trap nest is seen in the case of one pen of Barred Rock pullets at one station. The eggs for the month of January are given in the following table:—

EGG RECORD, DOMINION POULTRY STATION, BOWMANVILLE.

Pen No. 4—Barred Rocks—January, 1905.

Date.	Hen Number.											
	1	2	3	4	5	6	7	8	9	10	11	12
1		1	1		1	1		1				1
2		1	1		1	1		1	1			1
3				1	5					1		
4	1	1	1		1		1	1	1			1
5			1			1		1				1
6		1	1		1	1				1		
7				1	1	1		1				1
8		1	1		1							
9					1	1			1	1		1
10		1	1		1	1		1	1			
11			1	1				1				1
12		1		1	1	1		1			1	
13			1		1	1						1
14		1	1		1			1	1			1
15			1		1				1	1		
16		1	1		1			1	1			1
17		1		1	1	1						
18			1					1	1			
19	1	1	1		1	1		1				1
20			1		1			1				1
21		1	1	1	1	1		1				
22		1				1	1	1	1	1	1	1
23			1		1							
24		1			1	1		1				1
25			1		1							
26		1			1			1		1		1
27				1	1							
28			1			1			1			1
29		1		1	1							
30		1			1				1			
31			1		1			1				1
Totals....	2	17	20	8	27	15	3	18	11	5	2	17

It will be seen that two of these pullets laid only two eggs each while another laid 27 during the month. Half the birds in this pen averaged about five each, the other half, 19. Throughout the year the comparative difference of individuals was almost as well marked. It is an important fact that birds that laid well in the winter also did well during the summer. The pullet that laid 27 eggs in January had 25 to

her credit in June, and by the middle of October she had laid since January 1, 182 eggs.

A further record was kept to see how the eggs of these best-laying pullets would hatch, and if the chicks would have sufficient vitality. They proved from 20 per cent to 25 per cent more fertile than eggs from poor layers, and the mortality was about 40 per cent less.

Free Range for Chicks.—At several of the stations the colony houses were so arranged that after the chicks were a month old they were practically allowed free range. The colony houses were placed in an orchard and the chicks had the shade of the trees and the run of the orchard as well as of an additional pasture field. These chicks made rapid progress at an apparently smaller cost than those which were confined.

Crate-fed Chickens.—The greater demand and increased price for fatted chickens is very encouraging. The demand is not being supplied; much more poultry could have been sold from the stations than was produced. All poultry should be fattened before it is put on the market. To show that it pays to fatten cockerels, take the case of 12 birds fed at one station in October, 1904. Before going into the crates the cockerels weighed 41 lb. At eight cents per lb. they were worth $3.28. In 14 days they consumed—

Oatmeal, 56 lbs. at 1½ cents	84 cents.
Skim-milk, 80 lbs.	16 "
Grit, 5 lbs.	5 "
	$1 05

Making a total cost of $4.33. The dressed weight was 50 lb. and sold at 14 cents per lb., or $7; a gain of $2.67, equal to 61 per cent on the investment.

The Broiler Trade.—All poultry keepers can not produce broilers, but for those who can the trade is very inviting. Produce men will give from 20 cents to 40 cents per lb. live weight for plump young chickens weighing from 1½ to 3 lb. per pair, from March to the middle of May, the higher price for the earlier birds.

White Diarrhoea.—A disease known as 'white diarrhoea' was prevalent among incubator chicks last spring, especially throughout Ontario, to such an extent that it became alarming, and an investigation was instituted, to find if possible a cause and remedy. A number of the largest poultry plants in Ontario, a few in New York State, and two in Quebec were visited. In many places the disease had made its appearance for the first time, at several it had been noticed the previous year, and a few cases of it had been seen for several years, though not to an alarming extent. The chicks were attacked the first ten or twelve days after hatching; in some instances the disease was present before the chicks left the incubator. Non-absorption of the yolk usually accompanied the complaint. Several plants were visited where the death rate was from 75 to 100 per cent, and 50 per cent was quite common. The investigation

is incomplete, but the bulk of the data points to lack of ventilation in the incubator room, and high relative humidity as two of the probable factors. It was noticed that where only a small number of incubators were used in one room, the chicks were comparatively free. The investigation will be continued next spring. In the meantime it would not be amiss if those who operate incubators would see that the rooms in which they are kept have sufficient ventilation.

Selling Poultry and Poultry Products.—To sell well, poultry must be uniform, in good condition, and well dressed. Fatted poultry is worth from 25 per cent to 40 per cent more than that which is lean. The demand is so good this year that most of the poultry will find a market in Canada. There is no danger of overstocking the market if the product has the two essentials, excellence and uniformity. The egg trade is also encouraging from the producer's standpoint; the better the condition in which they reach the market, the higher the price. The best markets will pay from 2 cents to 5 cents a dozen more if the eggs are graded as to size and colour.

Bulletins.—Three bulletins have been issued: No. 7, 'Profitable Poultry Farming,' deals with Incubation, The Brooder, The Chicken Trade, Selection of Suitable Breed, Crate-Fattening Chickens, Preparing Chickens for Market, Marketing Chickens, Some Station Work in 1904, The Egg Trade, The Flock, Feeds for Poultry, and Trap Nests. No. 8, 'The Farmer's Poultry House,' describes the need of comfortable houses, the proper location, the essentials of a good house, and gives plans and descriptions of seven houses now in use at practical poultry plants. No. 9, 'Diseases and Parasites of Poultry,' gives description and treatment of thirteen common diseases, lice, mites and intestinal worms. The demand for the bulletin has been much larger than was anticipated and it has been found necessary to print a second edition. These can be obtained on application.

Poultry exhibits made at the fairs.—An exhibit illustrating the work of the division was made at a number of the fall exhibitions.

The exhibit showed styles of poultry houses, colony houses and brooders, typical cockerels in feeding crates, shaping board, cases of dressed chickens, trap nests, assorted and unassorted eggs, plans of poultry houses, samples of various poultry and chick foods, bulletins, &c. Much interest was taken in the exhibit and many complimentary remarks regarding its value and the work of the division were heard.

Poultry circles have accomplished wonderful results in some places; there is room for good work to be done by them in Canada.

EXPERIMENTAL FARMS BRANCH.

Much practical help is rendered to the farmers of Canada by the experimental farms. The literature published by the officers of the farms consists of annual reports of the various branches of the work in progress under the different climatic conditions prevailing in the many settled districts of the Dominion, and of special bulletins on important topics. These give helpful information and are of the greatest assistance

to all those engaged in agricultural work. The publications of the farms are sent free to every farmer who asks for them, and about 60,000 are now regularly supplied through the permanent mailing list at the central farm at Ottawa. The correspondence of the officers of the central and branch farms with those seeking information in every line of farming, is very large, and constantly increasing. Convincing testimony as to the value of the information furnished is given by farmers in every section of the country, many of whom attribute much of their success to the practical character of the information thus supplied to them.

In arranging the experimental work carried on at all the farms, special attention is paid to such aspects of farm industry as are likely to have the most practical bearing on the profits of the farmer. The examples given in improved methods of cultivating the soil, in the selecting of choice varieties of grain and other important farm crops combining a high degree of productiveness with earliness and good quality, and placing samples of these at his disposal, are all very helpful. The proper rotation of crops, so as to lessen the exhaustion of the soil, the renewal of its fertility by the use of natural and artificial manures, and the ploughing under of clovers and other leguminous crops, are subjects to which much attention is given. The demonstrations made with dairy and beef herds of cattle as to the most profitable methods of feeding, and the results of tests in the management of swine and sheep, feeding different sorts of food, looking to the economic production of pork and mutton, have also proved exceedingly useful; and by thus combining example with precept a widespread stimulus to production has been given in these important branches of farming.

THE PRODUCTION OF HARDY FRUITS FOR THE CANADIAN NORTHWEST.

Fruit is a healthful addition to the diet, and the farmer who can command a supply for himself and his family has gained a point of great advantage. Hitherto the success attending the efforts to grow apples in the western prairie country has been very limited; but of late experiments made in the cross-breeding of hardier sorts have given excellent results. The hardiness of some of the new varieties, which are quite large enough for domestic use, and are of good quality, is being thoroughly tested at many points at different altitudes in the Northwest, and the reports received concerning them are most encouraging. There is now very little doubt that within a few years a number of useful sorts will be available which will be quite hardy in all the settled parts of the Northwest country.

Efforts are also being made to stimulate the growing of small fruits, especially currants, gooseberries and raspberries, many of which are quite hardy through all the settled districts of the prairie country.

THE BREEDING AND SELECTION OF CEREALS.

While it is important that every branch of farm work be made the subject of investigation and experiment, the production of cereals, on which so much of our national prosperity is based, receives deservedly a large share of attention. By urging the use of clean and pure seed, and clean cultivation, much good is being done; while by producing earlier maturing varieties, associated with productiveness and high quality, the

area of wheat growing in Canada is being extended and the quality and quantity of our cereal products advanced. By judicious crossing and selection of improved forms, much further progress may yet be made : indeed the possibilities in the way of improvement in this direction seem to be unlimited.

VISITS OF FARM OFFICERS TO DIFFERENT LOCALITIES.

Visits have been paid by the Director and some of the chief officers from time to time to various parts of the Dominion with the object of ascertaining what progress is being made, and what branches of farming are likely to be most profitable in such places. Information is also gained as to how farm work can be most successfully conducted under the special conditions prevailing in the different sections visited. This work has aided in making the efforts of farmers more generally effective.

DISTRIBUTION OF GRAIN FOR THE IMPROVEMENT OF SEED.

Under my instruction this useful branch of the work has been continued; and the benefits it confers have been widely appreciated. The sample bags sent out have contained five pounds each in the case of wheat and barley, and four pounds in that of oats, sufficient in each instance for the sowing of one-twentieth of an acre. The samples of pease, Indian corn and potatoes have weighed three pounds each. They are all forwarded through the mail free. In consequence of the large demand, it has been found necessary to limit each applicant to one sample each season. Hence, it takes many years before the enterprising farmer can test all the varieties likely to be useful to him, and with the great influx of new settlers into different parts of the country, it is likely that there will be a steady increase in the demand for scuh material.

During the past year more than 40,000 farmers have thus been supplied with samples of the best strains of seed of the most important crops, the seed in each case being thoroughly cleaned and of the best quality obtainable. By the careful cultivation of these samples, any farmer can, in the course of two or three years, produce seed sufficient for a large area of land without cost to himself beyond that of his own labour.

AGRICULTURE AND LIVE STOCK DIVISION.

FIELD WORK.

The work in this division during the past year has been along the lines of (*a.*) methods of soil cultivation, (*b.*) values of different crops as grain or forage producers, and (*c.*) the study of rotations as means of improving soils.

Soil cultivation.—The aim in the work carried on in soil cultivation is to study the best methods of increasing the humus content of the soil and the retention of that humus where it will be most readily available to growing crops.

Crop values.—A comparison is being made of different varieties of corn for siloing purposes, of different varieties and kinds of roots for cattle feeding purposes, and of different kinds of grasses and legumes for hay making purposes. The comparative cost of production of these different crops is also being studied.

Rotations.—The value of rotation in soil improvement is very generally accepted, but comparatively little is known as to the best rotations to follow under different conditions. To gain some information on this point a number of different rotations are being given a fairly thorough test as to their effects upon different soils. Some 43 lots varying in area from 1 acre to 14 acres and making up 12 different rotations are being studied. The different rotations each include practically all kinds of soil.

ANIMAL HUSBANDRY.

Practically all classes of domestic animals are bred. The feeding and breeding operations include horses, dairy cattle, beef cattle, sheep and swine.

Horses.—The breeding operations with horses are very limited, but considerable work has been done in studying feeding problems in connection with this class of live stock during the past few years. The chief lines of work have been (1) the determination of the values of different kinds of hay as horse forage; (2) the study of different kinds of grain feeds for horses, and (3) an examination into the economy of feeding roots or other succulent feeds as a part of the ration for (*a*) working horses, (*b*) idle horses.

Dairy Cattle.—Quite extensive operations in breeding and feeding dairy cattle are carried on. Four herds of different breeds are under observation and experimentation. They are Ayrshires, Canadians, Guernseys and Shorthorns, with a number of grades of each breed.

They are being studied as to (1) comparative economy of production of (*a*) milk, (*b*) butter fat, (2) vigour, and length of useful period of life, and (3) comparative values as consumers of rough forage.

A study is also being made of the comparative value of pure-bred and grade herds (1) where value of milk and its products alone is considered, and (2) where value of offspring, whether pure bred or grade, at average market prices for each sort is included.

The question of the advisability of farmers keeping dual purpose cows is being studied, but results as yet are very indefinite. Where grade cattle are kept our findings seem to point to purely dairy strains as being the more profitable, but where pure-breds of each class are compared there does not seem to be very much difference since generally speaking, pure-breds of the Shorthorn milking strains sell for higher prices than pure-breds of most of the purely dairy breeds.

Experiments in feeding are being carried on continually and much valuable information as to the value of different feeds for milk production is being gained and distributed throughout the country. Methods of feeding are also being studied and much information gained.

Steers.—A considerable number of steers is fed each year. The lines of work pursued being (1) influence of age on cost of production, (2) influence of various rations on cost of production, (3) influence of method of feeding on cost of production,

and (4) influence of rate of feeding on cost of production. Results published from year to year have excited much interest. A new line of work is being incepted, viz.: the study of quality of stocker fed on quality of meat produced and on profit of feeding operations.

Swine.—Much work in the study of the economical production of bacon pigs is constantly under way. A bulletin dealing with this problem has just been published. Feeding operations during the past years have been fairly successful.

Sheep.—Two breeds are kept, Shropshires and Leicesters. They have done very well this year. Some experimental feeding has been conducted and will be found reported upon in the Experimental Farms Report for 1905.

HORTICULTURAL DIVISION.

The past season was a favourable one for nearly all kinds of fruits and vegetables in the horticultural division, and good crops were obtained, the apple crop being the largest in the history of the orchard.

Much useful information has been gained during the past eighteen years from the testing of the different varieties. Many have been discarded which did not prove of sufficient merit to continue growing, or were too tender to withstand the winters. Full descriptions have been made and careful records kept of both the good and poor varieties so that the history of them can be readily referred to in the future. The collection of promising seedling apples of Canadian origin was still further increased this year. This collection contains the best of the unnamed seedlings which are sent in for examination. A number of the seedlings raised from seed of some of the best varieties which have fruited at the experimental farm fruited for the first time this year, and among them are some of considerable promise.

Plums.—The European or domestic plum does not succeed in the colder parts of Ontario and in many parts of the province of Quebec, hence special attention has been given to the testing of the hardiest varieties of that class, and to the improvement of the native and American species which succeed over a large area. Some very good seedlings have fruited this year. What is desired is a plum with a thinner and tenderer skin than most of those now on the market, and an improvement in quality. It is believed that some of the experimental farm seedlings are better than many of the named varieties now on the market. The stones of these seedlings have been planted in the hope of raising other seedlings which will be still better.

Grapes.—During the past eighteen years nearly 200 varieties of grapes have been tested, and it is now possible to recommend with confidence a number of varieties which are almost sure to ripen every year where the climate is somewhat the same as that at Ottawa. This year, which was a moderately favourable one, 90 varieties ripened in the open air at the Experimental Farm. Different methods of training the vines have been tried, and the system now adopted is considered very satisfactory for districts where the vines have to be covered with soil in winter. In this system there

are two horizontal arms springing from a crown near the ground. These arms are renewed every year or every two years, and being easily bent are readily covered with soil, which has been found to be the best means of protecting the vines during the winter.

Currants.—The currant has not received as much attention as it deserves in America, but at the Central Experimental Farm this fruit has been given a thorough test as it is of great value in the colder parts of Canada where the large fruits do not succeed very well. Among the most promising of these are a number of black currant seedlings originated by Dr. Wm. Saunders The best of these are superior to the older varieties and as they become better known will, no doubt, supersede the older kinds.

Individuality of fruits.—The yield from each individual fruit tree is kept separate at the experimental farm, and it has been found that some trees of the same age and of the same variety and under apparently about the same conditions have yielded much better than others, thus showing a marked individuality in respect to their productiveness. If this individuality is preserved in trees grafted from the productive trees and from the unproductive, it will show the importance of propagating from the most productive trees. Trees were grafted both this year and last from trees varying thus in productiveness for the purpose of demonstrating whether this individuality is maintained or not.

In addition to the experiments with fruits already referred to, experiments with other fruits, such as pears, cherries, raspberries, gooseberries and strawberries were continued this year.

Experiments in spraying have been among the most important lines of work carried on by the horticultural division during the past fifteen years This year a power sprayer was bought, the operation of which has furnished useful information in regard to the economy of utilizing greater power than can be obtained with the ordinary hand pump.

Potatoes.—The potato is one of the most important food crops in Canada, and for this reason it has been given especial attention among vegetables. This year a bulletin was published on 'The Potato and its Culture' by the horticulturist, in which were given the results of experiments for the past eighteen years, with recommendations for the best methods of culture. It is hoped that this bulletin will have some influence in improving the potato crop in Canada. The blight and rot cause more or less injury to the potato crop every year, but during the past few years the loss has been much greater than usual. Careful experiments conducted at the Central Experimental Farm and elsewhere have clearly proven that the disease can be controlled by thorough spraying with Bordeaux mixture, but it is difficult to get farmers to spray. For some years it has been noticed and recorded that certain varieties were freer from blight than others. These are now being more carefully tested with the object of finding, if possible, a variety which by careful selection will withstand the blight so as to avoid the necessity of spraying.

Tobacco.—Experiments with tobacco were carried on again this year as usual, especial attention having been given to the relative state of maturity of the different kinds when harvested.

Forest Belts.—The forest belts continue to furnish useful information on the relative rate of growth of the different kinds of timber trees.

Arboretum and Botanic Garden.—The fine collection of trees, shrubs, and herbaceous perennials in the arboretum and botanic garden is attracting more attention every year. This year it looked particularly well as it was a very favourable season for growth. Each year additional information is gained on the many species and varieties in the collection, and this is given to the public as soon as it is practicable to do so.

ENTOMOLOGICAL AND BOTANICAL DIVISION.

Farmers and fruit growers in Canada are appreciating more and more every year the value of knowledge of injurious insects and other plant pests. The Government entomologists at the central experimental farm have continued their investigations of the life-histories and habits of all kinds of insects reported to them, or found to be injuring crops. Insect enemies of household goods have also been studied and much valuable information has been sent out from the division, by which considerable loss has been prevented. The marked increase in the correspondence of the division of entomology and botany shows that farmers are recognizing that they can obtain prompt and practical assistance, and are making use of the advantages offered by this and other divisions of the central experimental farm.

The duty of the officers of this division are to study as thoroughly as possible all insects and plants which are likely to cause loss to farmers and others, with a view to finding out as speedily as possible the most rational and economic way of dealing with these. The work is carried on actively both in the field where many experiments are tried, and in the office and museum. In the field the various insecticides and fungicides are tested as well as the machinery necessary for the work. Any one wishing to examine this machinery or to see how it is used is welcomed, and every pains taken to assist those who wish to learn. The collections in the museum are of great interest to visitors who frequently recognize an enemy by examining the cases, which they may have had difficulty in describing to the officers when seeking advice. These collections have been materially increased and improved during the past year, and very large additions have also been made to the collections of botanical specimens in the herbarium, and of weed seeds.

Many thousand specimens of insects and plants have been named by the entomologist and botanist which have been sent in by scientific students, farmers, horticulturists and others. The now extensive collections of the division have been considerably enriched from these correspondents, who have gladly presented to the museum all specimens asked for.

As in the past I have been able to meet the wishes of many farmers by sending the entomologist and botanist to deliver addresses before farmers institutes, and at

other meetings, where a large number can at one time learn what is being done to lessen losses to their crops, and where much useful information has been disseminated.

Insect Enemies.—The season of 1905, I am glad to say, has not been marked by the occurrence of any serious outbreak by insect pests, but the entomologist reports that there has been an exceptionally large number of inquiries about different kinds of injurious insects, and that in all cases he has been able to give advice by which loss might be lessened.

Cereal Crops.—The only injuries of importance which have been done by insects during the past year were by the Hessian Fly in Prince Edward Island, Manitoba and eastern Assiniboia. The Joint Worm appears to be increasing somewhat in Prince Edward Island. The Wheat Midge, which did considerable harm in British Columbia last year, extended its area somewhat in 1905. It also occurred in Prince Edward Island and possibly in Ontario. Steps have been taken to make the best remedies known as widely as possible. The corn crop was somewhat attacked by insects, but nowhere to any serious degree. The cold, dry spring in central Ontario retarded germination, and some loss occurred from the ravages of the Seed-corn Maggot. The Stem-borer did some harm in western Ontario.

Rusts.—These parasitic fungi which did so much harm last year to the wheat crops in the prairie provinces were this year hardly noticeable except in one or two restricted localities, and no appreciable loss was sustained on the general crop of the west.

ROOT CROPS AND VEGETABLES.

Cutworms as usual did some harm in all parts of the Dominion but were easily controlled by the poisoned bran remedy which has been so highly recommended by the entomologist. The most striking outbreak was by the larvæ of a species of noctuid moth, known to science as *Barathra occidentata,* but which has not as yet received any popular name owing to its great rarity in collections. Caterpillars of this moth were injuriously abundant in many places over a wide area. Complaints and specimens came from as far east as Nova Scotia and as far west as Nepigon, north of Lake Superior. The injuries in gardens at Ottawa, where the species was thoroughly studied, were considerable and a great many different kinds of plants were attacked. This insect illustrates the advantage of studying all kinds of insects whether scarce or not. As soon as it appeared it was recognized by the experts in the division, and steps were taken at once to check its ravages and at the same time to fill in some important missing links in its life history.

The Sugar-beet Webworm appeared in large numbers at Magrath, Alta., and caused in some fields a loss of between 8 and 10 tons of roots to the acre.

The Turnip Aphis was not as injurious as usual but still was the cause of considerable loss to cauliflowers and turnips in almost all provinces of the Dominion.

The Red Turnip Beetle, which is sometimes the cause of minor losses on cruciferous crops in the west, was this year sent in as a destructive pest for the interior of British Columbia and from the Yukon Territory.

FRUIT CROPS.

The San Jose Scale.—This destructive enemy of the fruit-grower still exists, and from lack of drastic and universal treatment by fruit-growers, has done much harm in the infested district in Ontario. Careful orchardists have, however, shown that the lime and sulphur wash, if properly applied, will allow them to grow paying crops in infested orchards and maintain their trees in a vigorous condition.

The Woolly Aphis of the Apple.—This although much dreaded by fruit growers on account of its ravages to the south of us and in other parts of the world, has not been the cause of much loss in Canadian orchards. During the past season, however, it has been present to a remarkable degree and there has been much inquiry concerning it. The native and introduced hawthorns seem to have been much more attacked than the apple. A similar species on the alders does not attack fruit trees as many suppose, and there is no danger from this insect.

FOREST AND SHADE TREES.

The *White-marked Tussock-moth.*—Public attention has been drawn to this insect which for many years has been destroying the beauty of the shade trees in some of our large cities. The civic authorities are now bestirring themselves and it is hoped that before long this trouble will disappear.

The Cottony Maple Scale has been abundant and very objectionable on the shade trees in London, Ont., and in some other western towns.

The Spruce Gall-Louse has been remarkably abundant this year and many inquiries have been received as to its habits.

The Larch Sawfly, which many years ago destroyed the whole tamarack forests of the northeastern parts of the Dominion, again this year appeared in noticeable numbers.

The Larch Case-bearer, a European insect which has never previously been detected in Canada, was this year found in some numbers on the European larch trees and native tamaracks at the central experimental farm.

With regard to all of the above injuries, advice and assistance has been given promptly. Many other insects of more or less importance have been studied and accurate records kept.

There has also recently been issued from the division a bulletin in which all the well-known insects injurious to grain and fodder crops, roots and vegetables, are treated concisely, and the best remedies given. As this bulletin is very fully illustrated, I trust that it will be of considerable use to those engaged in cultivating the soil in all parts of Canada.

CHEMISTRY DIVISION.

In the work of the past year there has been, as formerly, much done of immediate and direct help to the individual farmer, and also a considerable amount of research that will be of assistance in the various specialized branches of Canadian agriculture. As far as practicable, examination is made of soils, well waters, cattle feeds, insecticides, &c., &c., that may be sent in by farmers. In the neighbourhood of 500 such samples have been examined this year. This branch of work, in addition to the information given by correspondence in response to inquiries on farming matters, and more particularly relating to chemistry of agriculture, has proven of great and increasing value to the practical farmer. The rational treatment of soils with a view to the economic maintenance and increase of their fertility, the use of fertilizers, the relative values of fodders and feeding stuffs are among some of the more important matters treated of daily by letter. It is by such means that the farmer is educated in his work and afforded help that he could not otherwise obtain.

Of the researches instituted or continued during the year, mention may be made of several of the more important as follows:—

The Winter Care of Manure.—This series of experiments was planned to ascertain the losses of plant food that may take place from December to April, when piled in large and small heaps respectively. It is expected that the results will be of considerable help in the better care and application of this important source of fertility.

The Management of Orchard Soils with a View to Increasing their Fertility and the control of their Moisture Content.—This work was begun several years ago and includes a study of the effect of various leguminous plants grown as cover crops, and an inquiry into the soil moisture remained and lost under different systems of cultivation. It has been shown that by keeping a dry earth mulch until the tree has made its annual growth, say, July 1, followed by a leguminous crop to be turned under early the following spring, the tree may be furnished with all the moisture necessary for its growth and the filling out of the fruit, and the soil considerably enriched in humus and nitrogen.

The Loss of Nitrogen due to Fallowing.—Analyses have been made of a number of cultivated and virgin soils from the Northwest with a view to determine the exhaustion of plant food by fallowing and the continued cropping with grain. The results indicate a very considerable loss of organic (vegetable) matter and its concomitant, nitrogen, when this practice extends over a period, say, of 25 years. This investigation (which is still in progress) is one of great importance, for it points very emphatically towards the necessity of some change in the methods of the wheat growers if the fertility of the soil is to be maintained—the adoption of a rotation that will occasionally add humus and nitrogen to the soil. The amount of nitrogen lost by fallowing appears to be greater than that withdrawn by the crop of wheat.

Enrichment of Soils by Clover.—This series of experiments, begun in 1902 and continued yearly since that date, has given valuable and interesting data. The plan

consists in growing clover in pots and plots containing soil uniform throughout and of which the nitrogen content had been determined. At the close of each season the clover was taken up, weighed, cut finely, and returned to its respective pot or plot, as the case might be. In the following spring the soil is again analysed and the increase in nitrogen content ascertained. An average of the several experiments to date shows an enrichment in nitrogen of approximately 80 pounds per annum, per acre, in the first 8 inches of soil.

Reclamation of Swamp or Peaty Lands.—A prelimiary series of experiments to learn the special requirements of such soils was commenced this year. Various combinations of phosphoric acid, potash and lime were employed as fertilizers, and oats the crop used to ascertain their effect. The first season's results go to show that potash was the element that gave the largest return, though improved yields also followed the application of basic slag—an alkaline form of phosphoric acid.

Inoculation for the Growth of Legumes.—Further trials with clover and alfalfa have been made, using cultures kindly furnished by the Bureau of Plant Industry, Washington, D.C., and the Bacteriological Department of the Ontario Agricultural College, Guelph. Increased yields were obtained from certain of the inoculated plots. In the majority of the trials, however, the character of the soil and its drainage appeared to be more potent factors than the 'Nitroculture.' From an examination of the roots from the untreated and inoculated seed no material difference either in quantity or size of the nodules was observable. This points to an abundance of the nitrogen-fixing bacteria in the soil of the Experimental Farm, Ottawa.

Fodders and Feeding Stuffs.—The feeding value of a large number of concentrated feeding stuffs upon the Canadian market has been determined. These include the so-called stock foods and various milling and manufactory by-products. The relative nutritive value of the various farm roots has also been under investigation. There is an ever increasing demand from dairymen and stock feeders for information relating to feeds and fodders generally, and consequently the results obtained in the Experimental Farm Laboratory are of wide interest and value.

Investigations Relating to Dairying.—Certain important researches undertaken in connection with the dairying industry have occupied our attention. These include the examination of milk preserved by hydrogen peroxide as received from Denmark, the analysis of a milk powder prepared from whey, an inquiry into the volatile acid content of two-year-old cheese, and several other matters of more or less interest. The report of these investigations is published in Bulletin No. 6, Dairy Series, May, 1905.

Grades of Wheat.—In conjunction with the Cereal Division an investigation to determine the value of the various grades of wheat (Manitoba Inspection Division) was undertaken in the early months of the present year. The results are presented, together with those from the Cereal Division, in Bulletin No. 50 of the Experimental Farms Series.

CEREAL DIVISION.

Owing to the rapid influx of settlers into the great prairies of Manitoba, Saskatchewan and Alberta, and the constant demand for information in regard to the various problems connected with the cultivation of cereals in those districts, it has been deemed advisable for the present to pay special attention in this Division to the needs of these newer provinces, without losing sight, however, of the requirements of those sections of Canada which have been settled for a longer time.

New Varieties of Wheat.—Much attention is being given to the production of new varieties of wheat of high quality suitable to the needs of those sections of our country where the summer is of comparatively short duration and also to the production of such sorts as are required to meet unusual conditions in other districts. Considerable success has already been attained in these lines of work. Many thousand new sorts, chiefly single plants of each, were raised at the Central Farm this year, from among which the most promising kinds were retained for further trial. About a hundred carefully selected strains from the best of the older varieties were also grown. Some of these were rejected on account of weakness of straw, liability to rust, or for other defects, and the remainder will be propagated for test on a larger scale. Among them are some very promising sorts, including some new strains of Red Fife which, being of assured purity and ripening somewhat earlier than the parent variety, are of particular interest.

Other Cereals.—Many new cross-bred sorts of oats, barley and peas were grown at the Central Farm, though not in such large numbers as in the case of wheat. Only a small proportion of these will be retained for further trial, as it is not thought desirable to add to the number of varieties now in general cultivation, except when new sorts of distinct merit are produced.

Test Plots.—The usual comparative tests were carried on for the determination of the relative earliness, productiveness and other qualities of the leading varieties of the different cereals. The rather heavy rain-storms which occurred during the ripening season made the observations on the relative strength of straw particularly interesting. Nearly all varieties gave large returns, and the grain was of good quality.

The uniform test-plots of mangels, carrots, turnips, sugar beets and fodder corn gave very satisfactory results, the abundant rainfall throughout the growing season being favourable to the growth of these crops.

Western Wheat.—The cerealist, in charge of this division, was directed to visit some of the most important sections of Manitoba and Saskatchewan at harvest time to study the effects of soil and climate on the wheat kernel, and also to ascertain what varieties of wheat are to be found mixed with Red Fife, and to what extent these appear to lower the value of the wheat crop in general. Nearly a dozen easily distinguishable sorts were observed, and though the proportions in which some of them are present are small, others were found in very significant amounts. Most of these varieties are inferior to true Red Fife for the production of very strong flour, and their

presence lowers the actual value of the grain, even though the sale price may not be immediately lessened. Unfortunately some of these undesirable sorts have hard red kernels which easily pass for Red Fife.

These facts, as well as the presence in many wheat fields, of wild oats and other dangerous weeds, serve to emphasize the importance of careful methods of soil cultivation and the sowing of clean seed, true to name.

Grades of Wheat.—During the winter months an exhaustive study of the milling and chemical value of the grades of wheat in the Manitoba Inspection Division was made by the cereal and chemical divisions jointly, with a view to ascertaining how far the relative selling prices of the different grades might be considered as an expression of their true value. Much important information was gained by this work, and it was clearly demonstrated that some of the lower grades of wheat which are usually regarded as unfit for flour making (and which sell at relatively low prices in consequence) will produce a considerable amount of flour of good quality, from which excellent bread can be made. So long, however, as the demand of the public is for flour capable of producing extremely high, light loaves of almost white colour, it may be difficult or impossible for millers to grind the lower grades of wheat at a profit. The results of this investigation were published in Bulletin No. 50 of the Experimental Farm series.

POULTRY DIVISION.

The experimental work conducted during the past year in this Division has been of a nature calculated to be useful to the farming community at large. Among the more important experiments made, or investigations continued may be mentioned the following :—

1. Continuation of inquiry, begun three or four years ago, into the cause or causes of so many weak germs in eggs laid, in early spring, by hens which were kept in warm houses and gently stimulated to lay during the winter season. From time of going into winter quarters until spring these fowls had no opportunity to run outside. Their life and treatment during that period were strikingly artificial.

2. Continued investigation was made into what experimental work had shown to be another serious obstacle in the way of the successful hatching of chickens in early spring, and which is doubtless the result of weak germs, viz., the reason for the death about the eighteenth or nineteenth day, of so many fully developed chickens apparently unable to break their way out of the shell.

So many inquiries have been received in reference to these serious drawbacks to the farmers of early chickens as to lead to the conclusion that they are the cause of much loss in time and young stock to many persons and at a period of the season when both are more valuable than later on.

3. During the year an important line of work was begun and carried on with the view of building up and perpetuating prolific egg laying strains of fowls. By means

of trap nests the best laying fowls were detected and placed, according to varieties, in different pens to be used for breeding stock. From the progeny of these fowls the best layers will again be selected. In this way strains of prolific egg layers are likely to be available in the course of a few years. Past experience has shown that many fowls lay so few eggs as to be non-profitable and it is well that such birds, which are really living at the expense of the good layers, should be discovered and done away with.

4. With the object of building up hardy winter egg laying strains of fowls which will prove themselves to be prolific layers and correct market types as well, a poultry house consisting of two divisions with scratching shed attachment to each of the latter was erected and put into operation during the early part of December last. In this house there is no artificial heat. The windows of the scratching sheds, which face south, were opened during fine days of winter, and the fowls thus had the benefit of sunshine, fresh air and exercise, the latter in scratching for the whole grain which was thrown in the straw on the floor of the sheds.

The poultry house proper has a passage way from which the platform underneath the roosts is cleaned, the eggs collected and the mash and cut bone fed. The nests used are of the trap nest system. In this way it is anticipated to not only successfully carry out the work as outlined, but to find a remedy for the weak germs in early spring eggs. Observation so far carefully made points to fresh air and variety in the winter rations as likely means of overcoming the latter difficulty.

5. An important location of tuberculosis in fowls sent from British Columbia, and black-head in turkeys in a central part of Ontario, were features of the work of the year. In both cases post mortem examinations of diseased specimens, which had been forwarded, were made by Dr. Higgins, of the Veterinary Laboratory.

Other useful work in the comparison of different rations in winter egg producers; effects of various foods on fowls of different ages; experiments in artificial incubation and brooding were carried on and resulted in the obtaining of data which will be found at length in the Departmental Report.

BRANCH FARMS.

EXPERIMENTAL FARM FOR THE MARITIME PROVINCES AT NAPPAN, N.S.

Experimental work has been conducted with many different classes of agricultural products during the past year, especially with oats, barley and wheat, to gain information as to their relative productiveness, earliness and quality and to ascertain those most suitable for growing in the Maritime Provinces. Similar tests have also been made with pease, Indian corn, field roots and potatoes, with like objects in view. In this way very useful information has been obtained as to the most profitable varieties of these several farm products to grow in the Maritime Provinces.

The field crops of hay at Nappan have been very good, much above the average Oats, also, have given excellent returns.

Further experiments have been conducted in the feeding of swine to learn which are the cheapest foods to use there for the production of pork.

Tests have also been continued with fruits, both large and small. Many varieties of apples have yielded well; but plums, pears and cherries have given a light crop. Most sorts of small fruits have given good results. Further information has also been gained by the testing of vegetables, as to the varieties best suited to that part of the Dominion.

Many examples of all these products have been brought together and displayed at some of the principal agricultural exhibitions held in Nova Scotia, New Brunswick and Prince Edward Island, where they have been much admired.

EXPERIMENTAL FARM FOR MANITOBA, AT BRANDON.

Further experiments have been undertaken at the Brandon Farm in the feeding of steers, using such kinds of food as are generally available to farmers in Manitoba, to learn which food can be fed to the greatest advantage and produce beef at the least cost. Pure-bred cattle of several breeds are kept here. Male animals are also available for the improvement of stock.

A large number of varieties of cereals, Indian corn, field roots and potatoes have been tested in uniform plots side by side. also grasses, clovers and other useful plants, to find out which sorts are earliest, most productive and best in quality when grown in the climate of Manitoba.

Some useful trials have also been made with poultry, looking to the economical production of eggs as well as of fowl suitable for the table.

The orchards of cross-bred and seedlings apples are making excellent progress and quite a number of good varieties fruited this year. The best of these have been selected for propagation. the inferior sorts being rooted up to make space for new sorts annually produced.

The forest belts, timber plantations, avenues and hedges on this farm continue to attract much attention, and the success attending this branch of the work has awakened a general interest in tree planting in Manitoba.

A considerable distribution of young trees and shrubs is made yearly among the farmers of this province, while a large quantity of tree seeds is also sent out. As a result of this work, dwellings and farm buildings have been afforded shelter and many homes have been made more beautiful and attractive.

Experiments are also being conducted with the native plum, by selecting the many varieties which have been brought together and which have fruited, choosing for propagation only those which have shown superior earliness and excellence.

EXPERIMENTAL FARM FOR THE NORTHWEST TERRITORIES.

The branch Experimental Farm for the Northwest Territories is located at Indian Head, in the new province of Saskatchewan. At the outset this piece of land was bare prairie and in such open localities crops are liable to injury from strong winds, which prevail in some years. By the planting of a large number of trees and shrubs, satisfactory shelter has been obtained and the appearance and surroundings of the farm greatly changed for the better. The shelter afforded by the trees does much to protect the growing crops from injury and thus demonstrates the usefulness of trees for this purpose.

Many individual farmers also have planted considerable numbers of trees, thus following to some extent the example of the Experimental Farm, in which they have been aided by the annual distribution of packages of young trees and tree seeds from the Brandon and Indian Head Farms. From 1,000 to 1,500 pounds of seed of native trees are annually distributed from these two western farms.

Excellent fields of grain have been grown at the Indian Head Farm during the past year. For instance, ten acres of Preston wheat gave a yield of 460 bushels, or 46 bushels per acre. The yields of oats and barley were also very heavy.

The orchards of young fruit trees are fast coming into bearing and attract much attention from visitors. Many varieties of cross-bred apples and plums bore well during the past season.

Many experiments with alfalfa have been conducted during the past year. Plots of half an acre each have been grown side by side to test the relative hardiness and usefulness of seed obtained from different localities. Seed for some of these experiments has been kindly supplied by the Bureau of Plant Industry, United States Department of Agriculture, Washington, D.C., some of it brought from Turkestan as well as from several special localities in the United States, including Utah and Montana. The seed sown on some of these plots has been inoculated with the special bacteria intended to promote the growth of alfalfa, while that sown on other plots alongside has not been inoculated. The results of these and many other experiments will be found in the Annual Report of the Experimental Farms.

The usual uniform tests of all the more important cereals, Indian corn, field roots and potatoes have been continued here and much information gained thereby.

EXPERIMENTAL FARM FOR BRITISH COLUMBIA AT AGASSIZ.

The climate of many parts of British Columbia being well adapted for nearly all the fruits grown in temperate climates, a considerable proportion of the land under cultivation at the Agassiz Farm has been devoted to orchard purposes. A large collection of varieties of all the principal fruits has been brought together from many parts of the world and these are grown side by side. As they bear fruit, their relative quality is ascertained and only those which have superior merit are kept, the others being rooted up and, as far as practicable, new sorts planted in their place. At the recent

Dominion Exhibition at New Westminster a very fine collection of the fruit grown at Agassiz was displayed. This exhibit, which contained many new sorts, was much admired.

Recently a commercial orchard has been started, consisting of ten or twelve trees of each of those varieties which are considered of special value, the idea being to show the relative returns which may be had from cultivating these various sorts.

Experiments have again been conducted with varieties of all the more important farm crops to gain information as to the relative earliness, productiveness and quality of each variety. Samples of those sorts of grain which these tests indicate are likely to be most useful are sent to farmers in that province for trial.

Trials are also made from year to year, at the Agassiz Farm, with different varieties of clovers, grasses and other fodder plants.

Shorthorn cattle, Dorset horned sheep and Yorkshire and Berkshire pigs are kept on this farm, and the animals are all doing well.

The Superintendent of the Agassiz Farm attends meetings of farmers in different parts of the province, especially in those sections of the interior districts where fruit is extensively cultivated. His wide experience enables him to render much assistance to those embarking on this industry, and his efforts in this direction are much appreciated.

GENERAL CROPS.

The Dominion of Canada has again had a bountiful harvest, and in nearly all parts of the country the returns to the farmers have been of a most encouraging character. Successive favourable crops have induced large numbers of people to emigrate to this country, and the area of land under cultivation is rapidly increasing from year to year, and, in turn, the total volume of crops produced is greatly expanding.

ONTARIO.

In this province the hay has been unusually heavy, and the larger part of the crop has been well saved. In certain districts the early cut hay was injured somewhat by rain, but the entire loss from this cause has been comparatively trifling.

Fall wheat has produced an excellent crop, one of the largest for years; while the injury from insect pests has been very slight and comparatively little rust has been reported.

Spring wheat, of which the total area has decreased, has also given more than an average yield, while the quality is good and the kernel plump.

Barley is growing in popularity on account of the excellent results obtained from it for feeding purposes. The acreage devoted to this grain in Ontario is yearly increasing. This crop is well above the average.

The oat crop, which in this province is now the most important of all the cereals, is in advance of last year, when the crop was one of the largest on record. The crop this year is estimated at over 105,000,000 bushels. Most of this has been well saved and is of good quality.

Cold, wet weather prevailed shortly after the corn was planted, which was discouraging; but warm weather in July gave it a great stimulus and it developed rapidly, and by the time it was ready to cut it had made more than the average growth and turned out very satisfactorily.

In some districts, field roots have been injured by the 'turnip aphis' and other insects, which have materially reduced the crop. In other sections these roots have done well and given good returns. The weather has been favourable for growing and harvesting them.

Potatoes have yielded well in most localities and almost up to the time of digging were believed to be nearly free from rot ; but about this time rot set in and prevailed to such an extent as to reduce the value of the crop considerably. On the whole, however, there has been less rot than usual.

Under the stimulus of favourable conditions, most pastures have been good, and the dairy industry has flourished. High prices have stimulated production and the exports both of cheese and butter have been large and the returns very remunerative. Pork production has been well sustained, and the exports heavy.

The yield of apples is considerably less than last year, but as regards size and quality they are above the average. Peaches and pears have both given good crops, while plums and cherries have been below the average. Grapes have yielded largely and ripened well, and all sorts of small fruits have given satisfactory returns.

QUEBEC.

In the westerly counties of the province of Quebec there has been sufficient rainfall, the hay has yielded well and pastures have kept green and fresh and the output of the dairies has been heavy. The eastern counties have, however, suffered considerably from draught and in those districts there has been a lessening of the output of butter and cheese. Stock generally is reported to be in good condition.

Spring wheat has done well and in some districts exceptionally good returns have been obtained.

Oats are generally a very good crop and are said to be fully up to the average of past years.

Barley has succeeded well and given good returns, while the grain is also of good quality.

Corn in some parts has given an unusually good crop, while in other localities it is below the average. Field roots have given very good returns, while pease have yielded exceptionally well.

The apple crop in Quebec has been less than usual; but the high prices obtained have in most districts helped to compensate for the lighter crop.

THE MARITIME PROVINCES.

In Nova Scotia, New Brunswick and Prince Edward Island, notwithstanding that the season opened late and was cold and wet, thus delaying seeding, farm crops have been generally good.

Hay yielded a crop considerably above the average and most of it has been well saved.

Oats, also, have given excellent returns, in most localities much above the average, and the grain is plump and good. Barley has given a fair average yield. The yield of wheat has varied considerably in different districts ; but on the whole the returns are satisfactory.

Indian corn, although somewhat late in starting, had, in midsummer, favourable weather for growth and has given a weight of crop considerably above the average. Potatoes have also given a yield in excess of the average.

Field roots have given a fairly good crop, although not quite so large as was expected. Dry, unfavourable weather prevailed during the last few weeks of their growth, which prevented from reaching their usual size.

The apple crop has been rather light. The fruit, however, is of excellent quality and the high prices prevailing will probably fully make up for the shortage in yield.

MANITOBA.

The results of the harvest in this province have been most gratifying. The growth of the straw has been heavy, which has made threshing expensive; but the yield of grain has been good, the weight of crop in many instances being much heavier than was anticipated. It is expected that the average yield of all sorts of grain will be considerably higher than last year. As wheat maintains a good price, the results must be highly remunerative to those who have grown this cereal on an extensive scale.

The oat crop in many localities has been extraordinary in its weight, while the quality of the grain has been good. Barley, of which a considerable quantity is now grown, has given very satisfactory returns. The weather has been fine for harvesting and threshing; but the crop is so large and heavy that all the threshers available will be kept very busy until near the end of the year.

The stock and dairy interests are making satisfactory progress.

SASKATCHEWAN.

The crops in this province have never been better. The wheat in many localities has given from 30 to 40 bushels per acre on summer fallowed land; and, in some places, more than this.

Under my instructions the director of experimental farms visited Saskatchewan just before and during harvest and travelled over a large area of country favourable for wheat growing. He reported the crops as averaging remarkably well, and the returns since had from the threshers show that the estimates then formed have been substantially realized. A large area of new land has been got ready for crop next season, and with the rapid addition made to the population by the active immigration which has gone on during the past two or three years, will soon result in a great increase in the area of land under grain. The grain this year was practically all cut before frost occurred. There has been some injury from smut; but this is almost inexcusable, as the disease is so readily and cheaply prevented by treating the seed with copper sulphate or bluestone, before sowing. Several small patches of rust were met with; but the proportion of grain so affected was relatively so small as to be scarcely worth mentioning. Pease, Indian corn, field roots and potatoes all gave excellent crops.

ALBERTA.

In Southern Alberta, winter wheat has of late been grown with much success, and in that part of the province this crop is commanding more attention than any other, and at the present it occupies a far larger area than spring wheat. The variety known as Turkey Red is the sort mostly grown. This is a winter wheat of high quality, and in Southern Alberta it has been very productive. The soil and climate here seem well adapted to the growth of winter wheat, and its cultivation is rapidly extending.

All through Northern Alberta winter wheat has also been tested, and the results had during the past season have been quite encouraging. Spring wheat, however, holds its own in this section, and as yet occupies much the largest area. Oats have given remarkable yields of very plump grain. Barley, also has given very satisfactory crops. At Raymond, the centre of the district, occupied by the Mormons, an extensive beet sugar industry has sprung up and large quantities of sugar are being made. It is evident that the soil and climate here will produce sugar beets with an unusually high percentage of sugar.

BRITISH COLUMBIA.

The hay crop, which is one of the most important in this province, has been unusually large, and has been saved in good condition. All sorts of grain have done well. Oats occupy the larger area and have given a heavy yield of excellent grain. Barley and pease, although less grown, have been equally successful. Wheat is not much cultivated in this province; but this year has done very well except in some sections where the 'midge' has affected the crop and considerably reduced the yield. Indian corn and field roots have also done well and produced large weights of fodder.

The fruit crop, which is fast becoming an important one in this province, has, on the whole, been fairly satisfactory. The apple crop has been a medium one. Pears, also, have done well. Plums have produced a fair crop in most localities and in some districts the yield has been heavy. Small fruits of all sorts have given satisfactory returns.

The growing of hops is extending, the crop this year is good and high prices are expected.

The dairying industry is growing; but the production of butter is not yet nearly sufficient to provide for the needs of the home market. The production of eggs and poultry is also steadily increasing.

HEALTH OF ANIMALS BRANCH.

The operations of this branch of my department, which has now been almost entirely reorganized, have during the past year been characterized by great activity.

The live stock interests of the Dominion are constantly and rapidly increasing in importance and, especially in view of the widely varying conditions prevailing in different parts of the country and the consequent difficulties to be overcome, the value of effective machinery for the control and, where possible, the eradication of contagious animal diseases cannot be over-estimated.

Arrangements have been completed for the erection of new quarantine buildings at St. John and Halifax on the convenient sites recently secured at these places.

At Sherbrooke, P. Q., a point selected owing to its importance as a railway centre, a site has been secured for a small quarantine station to be erected during the coming season.

At Bridgeburg, Ontario, where owing to the large export trade in live stock at that point, it has been found necessary to station a permanent inspector, facilities for the examination of stock have been, at my request, furnished by the railway companies interested, although it will probably be necessary, in the near future, to provide facilities for the detention of animals imported subject to quarantine.

A building long required for this purpose has now been completed at Windsor, Ontario, and greatly adds to the safety and efficiency of the service there.

At Willow Creek, Saskatchewan, and at Gateway, Nelson and Midway, B.C., stations similar to those erected last year at other points on the boundary line in Western Canada, have been constructed and are now in operation.

At Sumas and Douglas, B.C., detention corrals have been erected by the railway companies under the supervision of my officers.

Satisfactory arrangements have been made for the veterinary examination of animals, not subject to quarantine, at the various inspection ports, although this is, in some cases, a matter of considerable inconvenience, owing to the isolated nature of the points at which railways cross the boundary.

Owing to a well-founded suspicion that some outbreaks of hog cholera owed their origin to American hogs in course of transit through Western Ontario I deemed it advisable last spring to issue new regulations for the control of this traffic, which is now being conducted on a much more satisfactory basis than formerly.

Owing to an alleged scarcity of material in Canada some of our packers began early in the season to import from United States markets hogs for immediate slaughter. While every possible precaution has been taken to prevent the introduction of disease through this channel, the trade is, undoubtedly, a most dangerous one, and I am seriously considering the advisability of taking steps to prevent its continuation beyond the present season.

I am glad to say that so far as hog cholera in Canada is concerned the efforts of the department to bring about its eradication have met with a very gratifying measure of success, as is evidenced by the fact that the number of outbreaks dealt with during the past year has been only 47 as compared with 151 in 1903-04, 360 in 1902-03, and 313 in 1901-02. It is also worthy of note that the disease has been almost entirely confined to one district, whereas it formerly threatened to seriously hamper, if not destroy, the hog industry of the country as a whole.

By far the most serious matter dealt with during the past year by the officers of this branch, and one which has taxed their energies to the utmost, has been the suppression of glanders.

This disease, one of the most dangerous and insidious maladies affecting any of the domestic animals, has been found to exist to a very serious extent among horses in several widely distant parts of the Dominion. The policy now pursued in connection with this disease, including as it does the payment of compensation to the owners of slaughtered horses, is, however, of such a nature as to offer good grounds for the hope that it will shortly be possible to control its ravages, and so prevent the heavy annual loss arising from this cause.

The order for the compulsory treatment last year of the cattle in the mange infected area in Alberta and Assiniboia, having given great satisfaction and proved highly beneficial to the animals dealt with, I thought it advisable to complete the work thus begun by again enforcing a similar measure. I am pleased to say that the results this season have been even more satisfactory than they were in 1904, as many owners who were at first in doubt as to the advisability of subjecting their animals to the treatment required by the regulations, were this year, after seeing the satisfactory results on stock of others, more than willing to comply with the requirements of the department. In order to show the extensive nature of the operations undertaken by the department in this connection, I need only say that 547,705 head of cattle were treated in accordance with the terms of the order.

The disease referred to in my report of last year as dourine or maladie du coit, which made its appearance last year among the horses of Southern Alberta is, this season, receiving careful attention at the hands of my officers.

A considerable number of affected animals have been destroyed while those suspected of being infected are quarantined until such time as it is possible to decide accurately as to their condition.

In order that this disease, which is nowhere thoroughly understood, and which appears to vary in its manifestations under different climatic conditions, may be care-

fully observed with a view to the ultimate adoption of the most intelligent and economical policy possible, I have established an experiment station at the point where it was originally discovered near Lethbridge. This station is under the care of a qualified comparative pathologist, who is closely watching the affected animals in his care, and at the same time carrying on a series of experiments having for their object the acquiring of a more definite knowledge as to its nature and characteristics than is at present at our command.

As will be seen from the report of the veterinary director general, the investigation into the nature and cause of Pictou cattle disease, which has been carried on during the past two years at Antigonish, N.S., has proved beyond a doubt that this malady, which has long been looked upon and dealt with as if it were of a contagious nature, is in reality due to the ingestion, under certain conditions, of the weed known as Senecio Jacobea, or Ragwort. This conclusion, which I may say, is beyond question, will enable the department to bring to an end the policy of slaughter and compensation which, since 1882 has been followed in dealing with this disease. In this connection, I may add that, with a view to ascertaining whether or not sheep or goats may be used with impunity in eradicating the dangerous and troublesome weed above referred to, a number of these animals are being at present maintained at the station, on which also a further short series of experiments with cattle is being carried on.

I regret that I cannot report any satisfactory progress in the investigation at Winnipeg into the nature of the disease of horses locally known as swamp fever. Some work has been done by the pathologists during the past season, but their efforts have been seriously crippled by lack of material, the malady having largely decreased in prevalence during recent years. This condition of affairs, if continued, will, I need scarcely say be likely to prove even more satisfactory to those interested than the most full and complete information as to the nature of the trouble.

The work of the biological laboratory, established in 1902 in connection with this branch, is steadily increasing. The number of pathological specimens forwarded for examination by our inspectors and others has, during the past year, nearly trebled. The importance of this work cannot be overestimated, as reliable information as to the nature of outbreaks of disease throughout the country is simply invaluable to owners of stock. Satisfactory progress is being made in other lines, such as the preparation of mallein, which in view of our present active policy in connection with glanders, would otherwise have involved a very considerable expenditure. As the institution grows, it is my intention to begin the manufacture of a number of similar preparations now used in connection with the diagnosis or treatment of animal plagues.

Several outbreaks of anthrax have been reported during the year. All cases, however, have been promptly dealt with, with the result that the outbreaks have, in this way, been confined, to the premises where the disease originally made its appearance. I regret to say, however, that in two instances human lives were lost through accidental inoculation before the inspectors had an opportunity of warning the owners as to the dangerous nature of the disease.

Our present policy with regard to tuberculosis appears to be giving satisfaction. It is to be hoped that the investigations now in progress in various countries will shortly result in the development of an intelligent policy of dealing with this serious malady. Meanwhile I do not think that anything would be gained by the adoption of more stringent regulations than those now in force.

A somewhat serious outbreak of sheep scab, which was discovered last winter in Ontario, was promptly dealt with by my officers with most satisfactory results. So far as can at present be ascertained, the disease has been completely stamped out, although as a measure of precaution, the district recently infected is being kept under close observation.

Considerable improvement has been brought about in the methods of handling live stock in transit, although there yet remains much to be done in this direction.

The inspection of live stock for export has been carefully and systematically conducted with a view to the safeguarding of this immense and constantly increasing trade.

In this connection it is gratifying to be able to report that, during the past season, upwards of 50,000 head of cattle were shipped from the Canadian Northwest, this being a marked increase over the numbers sent forward in previous years.

ARCHIVES BRANCH.

Last year I referred to the action taken by the government to centralize the records of the Crown. Before due effect could be given to the decision of Council, it was found to be expedient to construct a fire-proof building for the reception and preservation of documents. A substantial edifice has been erected, and within a few months the archives from several departments will be removed thereto.

In the report of the archives branch for 1904, which has been distributed in both languages, the archivist recommends the preparation of a guide to the sources of Canadian history. Scattered throughout the Dominion there are numerous collections of useful papers to which the attention of students and inquirers should be directed. To transcribe these records for our archives would be the work of years, and to acquire them would be difficult, and often impossible. I believe, however, that the public interest would be served if the papers were examined and summarized. I have, therefore, authorized an investigation to be made in the different provinces, and for a report to be prepared, showing (1) the location and condition of records, (2) the nature of the documents and the period they cover, (3) the terms or conditions under which they may be examined or copied by the public. When the information is complete the matter will be arranged in a convenient form so that there will be no difficulty in locating all the documents of a given period which are known to the archives branch.

The Rev. Father O'Leary, some time professor of history in Laval University, has been engaged for this work in the province of Quebec, and I am pleased to say that his efforts have been very successful during the past four months. His Grace the Arch-

bishop of Quebec has shown his appreciation of the work by issuing a circular to the priests and custodians of records in his diocese, inviting them to give free access to their papers for the purpose we have in hand. The investigation of the archives in the maritime provinces has been entrusted to Dr. James Hannay, the historian, who is particularly qualified to fulfil the task assigned to him. Work in the province of Ontario and the west will be conducted by members of the staff. Dr. Bain, of the Toronto Public Library, Professor Wrong, of Toronto University, and Professor Shortt, of Queen's University have generously offered to assist in the location of documents and in the preparation of the information for publication.

It is believed that this work will give a fair idea of our resources, and in cases where records are exposed to danger, steps may be taken to insure their safety.

The card index of the volumes already in the archives is being carried on as rapidly as possible, and several cases of loose documents have been arranged and classified. In order to meet a demand for information concerning the development of our constitution, a selection has been made from the more important documents from the date of the establishment of the Sovereign Council until the Constitutional Act. The volume will contain authentic copies of the treaties, of the articles of capitulation and the text of the Acts of 1774 and 1791. It is hoped that the volume may be ready for distribution towards the close of the approaching session.

As a result of the research of the late M. Richard, and of investigations since made by the department, there is naturally an accumulation of documents in Europe ready for transcription. The facilities for copying have been increased this year in accordance with the augmentation of the vote of last session. It will be seen from the archivist's report that sufficient work has been outlined in the Public Record Office to occupy the present staff for several years. The earlier records of the Hudson's Bay Company at the head office in Lime street, and the Canadian papers in the General Post Office are being transcribed, and an examination has been made of the Selkirk papers in Scotland. This collection, of over three thousand documents, proves to be of unusual interest and throws new light on affairs between the years 1810 and 1840. The work that is being done is of permanent value, and I have reason to hope that before many years the archives will be widely recognized as an important branch of the public service.

During the past year the department has received the following volumes.

LONDON OFFICE.

Nova Scotia—

Board of Trade, 1774-1790.
Colonial Correspondence, 1775-1801.
Dartmouth Papers, 1776.
Governors and Acting Governors, 1764-1799.
Militia and Naval Correspondence, 1794-1795.
Rolls of naval returns and maps, 1774-1790.

Maps and Plans—
Plan of Quebec.
Admiralty masters logs, 1759.
Miscellaneous papers, 1777-1786.
Survey of lands granted to the loyal disbanded emigrants and civil list of the navy and army, 1785.
Freeling's report from the P.M.G., 1790-1794.
Receiver General's entry book.
Observations on the report of the commissioners committee of inquiry orders, 1737-1771.
Commission book, 1759-1784.
Treasury, 1760-1771.
Instructions to agents.
American letter book, 1773-1783.
Canadian records, loose MSS.
Hudsons Bay Co. memorial book.
Correspondence of Sir John Harvey, 1839-1840.
America and West Indies, 1782-1785.
America and West Indies, various dates.
Cape Breton colonial correspondence, 1790-1801.
Governors and Acting Governors, 1791-1798.
Board of Trade naval returns from Port Sydney, 1785-1806; from Ports Halifax and Cumberland, 1752-1753.

PARIS.

Plan de la concession Begun.
Role des habitants refugées, 1762-1773.
Troupes compagnies détachées, 1658-1736.
Moreau St. Mery, 1697-1790.
Domaine d'Occident, 1736-1748.
Concessions reglements et arrêts.
Ile Royale, 1716-1742.
Louisbourg.
Ordonnance, 1733.
Fois et Hommage, 1723-1726.
Inventaire de l'artillerie, 1565.
Recensement Plaisance, 1671-1711.
" Terreneuve, 1687-1704.
" Port St. Pierre, 1720-1728.
" Miquelon, 1776-1784.
" Isle St. Jean, 1728-1758.
" Mount St. Louis, 1699-1713.
" Havre aux Sauvages, 1719-1728.
Famile emigre, 1790.
Depots des Fortifications des Colonies.
Voyage du Sr. de la Regne, 1752.

III.—PATENTS OF INVENTION.

The following comparative tables show the transactions of the Patent Branch of the Department of Agriculture, from November 1, 1895, to October 31, 1905:—

Years.	Applications for Patents.	Patents and Certificates Granted.			Caveats.	Assignments of Patents.
		Patents.	Certificates.	Total.		
1895.	3,387	3,074	422	3,496	343	1,550
1896.	3,728	3,488	413	3,901	306	1,420
1897.	4,300	4,013	284	4,297	377	1,551
1898.	4,200	3,611	262	3,873	363	1,657
1899.	4,305	3,151	412	3,563	311	1,467
1900.	4,628	4,522	482	5,004	283	1,914
1901.	4,817	4,766	551	5,317	302	2,323
1902.	5,301	4,391	510	4,901	317	2,339
1903.	5,912	5,673	432	6,105	328	2,384
1904.	6,061	6,091	517	6,607	303	2,472
1905.	6,355	6,111	536	6,647	300	2,576

Detailed Statement, Patent Office Fees.

Years.	Patents.	Assign ments.	Caveats.	Copies.	Subscrip- tion to 'Patent Record.'	Notices to Apply for Patent.	Sundries	Total.
	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.
1895. .	78,223 52	3,194 00	1,854 35	761 54	245 98	1,951 30	129 79	86,358 48
1896. .	85,060 61	3,130 56	1,790 65	898 27	420 60	2,245 79	57 04	93,532 52
1897. .	93,298 16	3,250 23	2,108 57	969 33	252 53	2,110 89	128 21	102,117 92
1898. .	91,176 44	3,641 90	1,935 74	706 50	266 44	1,463 10	172 73	99,361 95
1899. .	98,669 92	3,781 71	1,533 25	1,028 80	198 05	1,912 00	137 83	107,261 56
1900. .	104,848 96	4,255 40	1,405 00	932 54	552 71	1,742 70	115 15	113,852 46
1901. .	109,985 59	4,506 07	1,479 25	882 87	592 47	2,484 90	133 22	120,064 37
1902. .	119,766 43	5,079 20	1,565 35	1,112 59	327 95	1,883 00	162 30	129,896 82
1903. .	130,561 00	5,309 00	1,803 00	1,067 82	373 75	1,994 25	254 99	141,363 81
1904. .	134,676 47	5,831 10	1,660 44	1,201 08	391 75	1,827 25	308 01	145,896 10
1905. .	140,588 34	5,842 75	1,650 00	1,566 69	668 80	1,491 50	277 37	152,085 45

The Patent Office fees received during the year ended October 31. show a surplus of $87,911.12 over the working expenses of the office as per subjoined table.

Receipts.	$ cts.	Expenditure.	$ cts.
Cash received	152,085 45	Salaries	44,430 00
Cash refunded	2,744 33	'Patent Record'	17,000 00
			61,430 00
		Receipts over expenditure	87,911 12
Net cash	149,341 12		149,341 12

The following is a table of the countries of residence of the patentees for the years named:—

Countries.	1895.	1896.	1897.	1898.	1899.	1900.	1901.	1902.	1903.	1904.	1905.
Canada	707	740	756	710	601	707	744	654	794	837	888
England	179	215	266	261	205	254	256	239	248	310	309
United States	1,980	2,270	2,666	2,312	2,038	3,216	3,423	3,164	4,222	4,417	4,451
France	39	21	24	26	36	40	50	45	57	65	62
Germany	102	117	126	124	112	157	125	100	116	185	171
Other countries	85	122	173	165	159	148	168	189	236	277	230
Total	3,074	3,488	4,013	3,611	3,151	4,522	4,766	4,391	5,673	6,091	6,111

The Canadian patentees were distributed among the provinces of the Dominion as follows:—

Provinces.	1895.	1896.	1897.	1898.	1899.	1900.	1901.	1902.	1903.	1904.	1905.
Ontario	451	430	464	383	310	396	407	373	438	477	509
Quebec	177	201	178	171	160	164	185	148	194	171	206
New Brunswick	13	12	20	26	7	14	26	14	18	33	26
Nova Scotia	19	32	22	27	18	21	17	26	22	35	27
Prince Edward Isl'd.	6	2	2	4	8	1	0	1	2	1	1
Manitoba and the N.-W. Territories	18	28	36	45	50	42	52	40	64	61	58
British Columbia	23	35	34	54	48	69	57	52	56	59	61
Total	707	740	756	710	601	707	744	654	794	837	888

Patents issued to residents of Canada, with the ratio of population to each patent granted:—

Provinces.	Patents.	One to every
British Columbia	61	2,929
Ontario	509	4,289
Quebec	206	8,005
Manitoba and North-west Territories	58	8,050
New Brunswick	26	12,736
Nova Scotia	27	17,022
Prince Edward Island	1	103,259
Total	888	

Statement of the number of patents issued under the Act of the session of 1892, 55-56 Vic., chap. 24, on which the fees are paid for periods of six, twelve or eighteen years, at the option of the patentee; and of patents on which certificates of payments of fees were attached after the issue of patents originally granted for periods of six and twelve years.

Years.	Periods for which the Fees were paid on first issue.			Patents on which Certificates were attached after issue.	
	6 years.	12 years.	18 years.	6 years.	12 years.
1895 (12 months ended October 31)	3,049	5	20	.....	.....
1896 " "	3,443	11	34	2	.....
1897 " "	3,981	8	24	15	3
1898 " "	3,586	3	22	176	9
1899 " "	3,125	3	23	291	13
1900 " "	4,489	4	29	366	21
1901 " "	4,719	8	39	408	31
1902 " "	4,362	2	27	412	39
1903 " "	5,630	2	41	405	27
1904 " "	6,059	9	23	493	24
1905 " "	6,079	4	28	505	31

The preceding tables show that there has been an increase in most of the transactions of the Patent Office during the past year. The total revenue for the year ended October 31, 1905, was $152,085.45, exceeding all previous years; resulting in an increase of $6,189.35 over the preceding year, and a surplus of $87,911.12 over the expenditure.

The total number of reports issued by the examiners during the year was 8,671.

Out of the total number of patents granted during the year, there were 4,451 issued to inventors resident in the United States, being nearly 73 per centum of the whole issue.

During the year there were eight patents re-issued.

Patentees who are resident in foreign countries, continue to avail themselves of the privilege granted under section 8 of 'The Patent Act,' by giving notice of intention to apply for patents in Canada. The number of these notices registered during the year was 746, yielding a revenue of $1,491.50.

The 'Canadian Patent Office Record' continues to be published monthly. It contains a transcript, with drawings, of all claims of patents granted, dates of filing, dates of issue, and length of term for which fees have been paid; also names and residences of patentees, as well as containing a list of registered copyrights, trade marks and designs. This publication is of great and increasing value to all who are interested in patents, trade marks, copyrights and designs. It affords convenient and easy reference to the claims of all patents granted in Canada, and thus enables both inventors and the public to see exactly what is patented. This publication is supplied to foreign patent offices, and is also sent without charge to the free libraries in Canada, and in foreign countries, with the object of diffusing in the public interest the information therein contained. The publication is also furnished to the public at $2 per annum, or 20 cents for single monthly numbers.

This branch of my department is indebted to the British, Commonwealth of Australia, United States, French, Mexican and Japanese Patent Offices, for their official reports.

It cannot be too strongly urged, that patentees and their solicitors should not delay until the last day in remitting partial fees of the six and twelve years' terms. If these fees are received after the expiry of either term, the patents will cease and determine, the Commissioner not being vested with the discretionary power, under any circumstances, to revive them. A revival can only be secured by a private Act of Parliament, the obtaining of which entails considerable expense to the patentee. It may further be added that the Committee on Private Bills usually discourages applications of this kind, on the ground that no one should be denied the right of manufacturing, using or vending an invention which has become the property of the public. Exceptional cases may arise, however, in which the patentee or the holder of the patent may be justly entitled to relief from parliament.

It is in the interest of both the applicants and the office that great care should be taken by applicants and their attorneys in the preparation of the papers and drawings which are required by the rules and forms.

Since the Act of 1903, amending the Patent Act, came into force (August 13), a very large number of applications have been received from patentees to have their patents made subject to the conditions of section seven. In dealing with these applications the requirement of the law in regard to manufacture has been kept in mind. The applications which have been granted are those relating to patents for inventions such as the following: An art or process; improvements on a patented invention when both patents are not held by the same person; appliances or apparatus used in connection with railways, telegraph, telephone and lighting systems, and other works usually under the control of public or large private corporations, and which appliances or apparatus cannot be installed or constructed without the consent of such corporations; and certain inventions which are manufactured or constructed only to order, and are not, according to custom, carried in stock.

The total number of patents placed under this section from August 13, 1903, to October 31, 1905, is 5,102.

In dealing with applications for extensions of time to manufacture and import, the law is applied according to its strict and literal meaning, and the applications are granted only when the applicant has clearly established to the satisfaction of the office, by affidavit or solemn declaration, that the failure to manufacture or import is due to no fault of his, but to reasons beyond his control. Although these applications continue to be quite numerous, it is seldom that such a case is made out as warrants the granting of the application.

The clerical work of this branch of my department in the matter of the transaction of its correspondence, is more prompt than at any time in its recent history, and I am further pleased to say that the condition of the Examiners' Divisions has greatly improved.

Impressed with the justice of the plea of the inventors and manufacturers for more prompt services in dealing with applications for patents, I have from time to time augmented this staff by appointing graduates in the various branches of science, with the gratifying result that applications are now considered and dealt with within a month to three months from the date of filing, instead of, as in former years, from six months to eighteen months.

The growth of the business of this office, and the accumulation of its records, called for more filing space, and to this end I have had suitable steel shelving, with drawers, substituted for the wooden cupboards in the record room, thus economizing in space, rendering the room more fire-proof, as well as providing a more sanitary condition than was experienced when the cumbersome cupboards, occupying much space, were in use. The replacing of these wooden cases by steel shelving, has multiplied the filing space about two-thirds.

IV.—COPYRIGHTS, TRADE MARKS, INDUSTRIAL DESIGNS AND TIMBER MARKS.

STATEMENT of fees received by the Copyright and Trade Mark Branch from November 1, 1904, to October 31, 1905.

Months.	Trade Marks.	Copy-rights.	Designs.	Timber Marks.	Assign-ments.	Copies.	Totals.
1904.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.
November	1,623 33	86 00	55 00	6 00	18 44	4 50	1,793 27
December	1,338 25	130 00	130 00	4 00	6 00	10 00	1,618 25
1905.							
January	1,976 90	93 10	46 00	2 00	45 00	23 50	2,186 50
February	1,414 85	72 00	80 50	10 00	6 00	12 50	1,595 85
March	2,002 25	108 50	88 00	.....	103 00	18 50	2,320 25
April	2,134 20	98 50	97 00	4 00	45 00	15 50	2,394 20
May	1,851 50	89 50	74 00	6 00	36 00	25 50	2,082 50
June	1,461 40	129 50	60 00	10 00	21 00	28 50	1,710 40
July	1,895 40	91 50	50 00	.....	10 00	21 00	2,073 90
August	1,740 00	107 50	43 00	4 00	11 00	16 00	1,921 50
September	1,975 25	134 50	92 00	2 00	14 00	21 00	2,238 75
October	1,523 90	145 00	60 00	8 00	6 00	28 50	1,771 40
Total	20,937 23	1,285 60	875 50	56 00	327 44	225 00	23,706 77

The following table shows a comparative statement of the business of this branch from 1894 to October 31, 1905, inclusive:—

Year.	Letters Received.	Letters Sent.	Copyrights Registered.	Certificates of Copyrights.	Trade Marks Registered.	Industrial Designs Registered.	Timber Marks Registered.	Assignments Registered.	Fees Received.
									$ cts.
1894	1,882	2,720	546	216	311	39	20	77	9,463 63
1895	2,184	3,279	601	163	374	52	20	70	11,673 26
1896	2,185	3,437	653	212	331	68	14	161	10,579 54
1897	2,606	3,548	756	273	446	75	13	94	14,101 93
1898	2,576	3,453	734	275	423	136	15	114	13,535 17
1899	2,487	2,910	702	237	430	112	5	117	14,161 28
1900	2,679	3,213	893	247	447	126	22	136	14,782 53
1901	2,605	3,211	888	249	521	146	24	183	16,823 26
1902	2,687	3,257	900	196	528	164	26	222	17,703 09
1903	2,687	3,211	900	176	557	88	23	272	18,086 25
1904	2,858	3,293	1,106	228	621	107	25	118	20,647 30
1905	3,367	3,902	1,130	189	661	139	22	154	23,706 77

The particulars of the registrations made by the Trade Mark and Coypright Branch of the Department of Agriculture during the year ended October 31, 1905, are as follows:—

I. Copyrights—

Full copyrights without certificates	876	
Full copyrights with certificates	189	
Temporary copyrights without certificates	9	
Temporary copyrights with certificates	2	
Interim copyrights without certificates	39	
Interim copyrights with certificates	15	
		1,130
II. Trade marks		661
Renewals of specific trade marks		5
III. Industrial designs		139
Renewals		6
IV. Timber marks		22
V. Assignments		154
Total registrations		2,117

V.—PUBLIC HEALTH AND QUARANTINE.

In addition to the ordinary threatening of epidemic disease from without, this year has been specially marked by the outbreak of Asiatic cholera in Europe, and of yellow fever in the United States.

Strict precautionary measures, ordinary and special, have been necessary for the sanitary protection of the country, and have proved themselves to have been successful, disease having been again and again arrested and stamped out at my quarantines. The effects of this work on the country, leading to the negative result of the absence of epidemic diseases in our homes and families, is but too apt to be overlooked. People are prone to take freedom from disease as a natural condition, and fail to realize to how great an extent they are indebted for this to the protection work done at the coast and frontier outposts, where disease is arrested and not allowed to enter and infect the country. Other vastly less important services—but kept before the public eye by positive, instead of only negative results—are often more thought of than the quiet, steadfast, all-important protective work of the public health service.

The continued public and professional demand for governmental recognition of the importance of preventive medicine, and the expediency of placing this important branch of the public service on the same footing as it stands on in nearly all progressive countries is instanced by the fact that I am again in receipt of a copy of a report and resolution, adopted by the Canadian Medical Association at its annual meeting, in Halifax, in August last, again pressing upon the consideration of the government the expediency of creating a department of public health under one of the existing ministers.

No case of plague having been reported in San Francisco since March 1, 1904, I felt justified in removing the special inspection of vessels from that port on account of that disease. So that since January 1 last these special inspections have not been carried out.

Extra coast and frontier inspections were instituted or continued by me for shorter or longer periods, as seemed to be required, at the following places: Canso, N.S.; Gateway, B.C.; North Portal, Sask, and Owen Sound, Sault Ste. Marie, Bruce Mines, Thessalon and Fort Francis, Ont.

In addition to the officers holding the above-mentioned posts, Dr. James Patterson, of Winnipeg, has continued to act for me in the management and suppression of small-pox in the Northwest Territories. So well has this been done that there is now no case of that disease in the newly created provinces of Alberta and Saskatchewan, nor in the Territories.

Circulars of warning and instruction have been issued from time to time, as the special threatenings of disease on both our coasts and on our frontier seemed to require.

Bubonic plague has occurred during the year in British South Africa, Arabia, Argentina, Australia, Brazil, Chile, China, Egypt, Formosa, Hawaii, India, Japan, Mauritius, Panama, Peru, Philippine Islands, Russia, Siam, Straits Settlements, Turkey and Zanzibar. Its ravages in India have been particularly marked. The total number of deaths in India officially recorded from plague since 1896 was up to the end of December, 1904, three millions one hundred and fifty thousand. Last year the deaths were over a million, being 1,040,429. This year they will be at least as many. These are the official figures, and are admitted to be below the mark on account of concealment on the part of the inhabitants. This disease has presented itself at several ports in Great Britain this year, but with the exception of three cases in Leith, it was confined to the initial imported cases.

Cholera has occurred in Austria, Galicia, China, Germany, India, Japan, Philippine Islands, Russia, Straits Settlements and Turkey.

The sudden outbreak of this disease in Prussia at the beginning of last month, and the presence of sixty or more cases of the disease among Russian emigrants in Hamburg, awaiting transportation to this continent, have given cause not for popular alarm, but for increased watchfulness on the part of my officers who safeguard the Atlantic seaboard.

The invasion of the southern states of the Union south of us by yellow fever, for the first time since sanitary science has established the role played by the *stegomyia* mosquito in the communication and extension of this disease, has furnished an opportunity for combating the threatened epidemic on these new lines. The result has proved that where early notification of new cases can be secured the disease can be readily controlled from spreading. This confirms the knowledge already acquired from the experience of the last few years in Havana.

Small-pox has again prevailed almost world-wide this year. Although the epidemic of this disease in the United States is at an end, local outbreaks in various places close to the international border have required my placing temporary inspecting officers at various times. And it has as usual threatened our Atlantic and Pacific seaboards.

Another international tuberculosis conference has just been held in Paris in the early part of this month. Like the one which was held in London in 1901, it has been noted principally for a sensation which comes from Berlin. The views laid down by Koch at the London conference, that bovine tuberculosis is practically free from danger to man have not been generally sustained. And now the newspaper reports concerning Professor Behring's alleged cure for tuberculosis do not contain anything definite or reliable. It seems probable that Prof. Behring reported to the conference the results of investigations in the immunization of cattle against bovine tuberculosis, with reference, perhaps, to the possible application of the same methods to human tuberculosis. Professor Behring's name carries great scientific weight with it, and we must only await further developments with patience.

Continued good effects have marked, during the year, the treatment of the lepers now carried out at my lazaretto at Tracadie, N.B. The symptoms both general and

local have in many cases been modified and ameliorated. In one case indeed an apparent cure has been effected. Whether it be permanent or only temporary, time alone can show.

The diseases which have been brought to my maritime quarantine stations during the year are : Small-pox, scarlet fever, measles, enteric fever, chicken-pox, diphtheria, mumps and epidemic dysentery.

In not a single instance did any one of these diseases gain an entrance through any of my organized quarantine stations. My frontier inspections were also very efficient in protecting the public health of the country with the least possible interference with travel and traffic.

Progress is being made in the work of completing the equipment of my various maritime stations. At Partridge Island quarantine, St. John, N.B., the additional detention houses for suspects and the winter hospital spoken of in my last annual report have been erected. At Lawlor's Island quarantine, Halifax, N.S., steps have been taken for the erection of a winter hospital.

Details of the year's work at my different stations, at the Tracadie leper lazaretto, in the Northwest Territories, and on the frontier will be found in the annexed reports of my Director-General of Public Health and of my other officers.

VI.—CENSUS AND STATISTICS.

In the last session of Parliament a statute was enacted for organizing under the Minister of Agriculture a permanent office to be called the census and statistics office. It repeals the three Acts of the Revised Statutes of Canada relating to the census and to general and criminal statistics, and makes provision for:—

1. Taking a general census of Canada in the first year of each decade, commencing with 1911.

2. Taking a census of population and agriculture for the provinces of Manitoba, Saskatchewan and Alberta in every tenth year, commencing with 1906.

3. Collecting, abstracting and tabulating from time to time in the intercensal years statistics and information relating to agriculture, commerce, crime, education, manufactures, births, marriages and mortality and other subjects, for publication at the discretion of the Minister of Agriculture.

4. Collecting, abstracting and tabulating statistics of crime in the Dominion, and printing the results in an annual report to Parliament.

5. Abstracting and tabulating in concise form such information on various subjects susceptible of being represented by figures as is contained in departmental or other public reports and documents.

6. Making special investigations under the authority and direction of the Governor in Council, and carrying out such other duties as may be assigned to the office by the Governor in Council.

Besides employing officers and enumerators to take the census of the country at the regular period provided in the Act, the Minister of Agriculture may also employ from time to time such agents or persons as are necessary to collect for the office statistics and information relating to such industries and affairs of the country as he deems useful and in the public interest. But in case a plan exists in any province for collecting agricultural, commercial, criminal, educational, manufacturing, vital and other statistics, the Minister may arrange with the local authorities or officials for the collection and transmission of such information as is required by schedules prepared by the census and statistics office, under his direction and approved by the Governor in Council and in collecting statistics in the manner here provided, the Minister may call upon public officers to furnish copies of such papers, documents and information as lie in their power, with or without compensation as regulated by Order in Council.

The custodians of provincial, municipal or other public records and documents, or of any records or documents of any corporation from which information in respect to the objects of the Act can be obtained, are required to grant access thereto to any officer or agent deputed for that purpose by the Minister for obtaining such information, and a custodian who refuses or neglects to grant such access or otherwise seeks to prevent or obstruct any person employed in the execution of the Act becomes guilty of an indictable offence.

Every person who refuses or neglects to fill up and return a schedule when and as required by a person employed in the execution of the Act, or who makes a wilfully false answer or statement as to any matter specified in the schedule, is liable to a penalty of not more than $100 and not less than $10.

Every person who refuses or neglects to answer any question requisite for obtaining any information in respect to the objects of the Act is liable to a penalty of not more than $50, and not less than $5 for every such refusal or neglect.

Every person who otherwise refuses or neglects to furnish information required of him under the Act, or who gives false information or practises any deception, is liable to a penalty of not more than $100 and not less than $10.

A document or paper purporting to be a form authorized for use in taking the census, or the collection of statistics or other information, or to set forth instructions relating thereto, which is produced by a person employed in the execution of the Act, shall be presumed to be supplied by the proper authority to the person producing it. But every officer or other person employed in the execution of the Act who, in the pretended performance of his duties, obtains or seeks information which he is not authorized to obtain, becomes guilty of an indictable offence.

In the case of an occupant of a house, a sufficient requirement to fill up and sign a schedule having thereon a notice requiring that it be filled up and signed within a

stated time, is the leaving of such schedule by an enumerator at any house or part of a house of which such person is an occupant.

In the case of any person or firm, or of any body corporate or politic, a sufficient requirement to fill up and sign a schedule having thereon a notice requiring it to be filled up and signed within a stated time is the leaving of such schedule at the office or place of business of any person or firm, or of any body corporate or politic, or his or its agent, or the delivery of such schedule by registered letter; and, if so required in the notice, to mail the schedule within a stated time to the census and statistics office; and all the provisions of the Act relating to offences and penalties apply to the provisions of this and the foregoing paragraph.

It is proposed to take a census of population and agriculture for the provinces of Manitoba, Saskatchewan and Alberta in June of next year, by the employment of enumerators in the usual way of taking a census; and an effort will also be made to collect statistics of the manufactures of the Dominion through the agency of the post office. But in the case of manufactures, as well as population and agriculture, the inquiries will be limited to a few principal heads.

CRIMINAL STATISTICS.

Criminal statistics have been compiled for the year ended September 30, 1904. They show that the number of charges for indictable offences in the Dominion was 9,901, and the number of convictions 6,754. In the previous year the charges numbered 9,642 and the convictions 6,541. The increase of charges is 259 or 2·68 per cent, and of convictions 213 or 3·25 per cent. The percentage of convictions to charges in the year was 68·21 per cent, which is higher than in any previous year of the decade, the ratio of 1903 being 67·84; of 1902, 66·22, and of 1901, 68 per cent. The following table gives the number of charges and convictions, together with the per cent ratio of convictions to charges, in the years 1903 and 1904.

Provinces.	1903.			1904.		
	Charges.	Convictions.	Convictions to Charges.	Charges.	Convictions.	Convictions to Charges.
			Per cent.			Per cent.
Prince Edward Island	53	38	71·70	41	28	68·30
Nova Scotia	672	444	66·07	664	434	65·36
New Brunswick	243	155	63·78	213	122	57·28
Quebec	2,086	1,676	80·34	2,139	1,738	81·25
Ontario	4,451	2,884	64·80	4,701	3,034	64·54
Manitoba	476	381	80·04	611	489	80·03
British Columbia	803	516	64·26	529	379	71·64
Territories and Yukon	858	447	52·10	1,003	530	52·84
Totals	9,642	6,541	67·84	9,901	6,754	68·21

The highest ratio of convictions to charges in 1904 was obtained in Quebec and Manitoba, and the lowest in Ontario and the Northwest Territories and Yukon, an evidence in the latter case, however, more probably of readiness to prosecute than of failure of justice.

The number of convictions under the heads of indictable offences and summary convictions in 1904 was 54,946, being 4,543 more than in 1903, and 11,410 more than in 1902. Under the head of indictable offences the increase was 213 over 1903 and 1,094 over 1902, while under the head of summary convictions the increase was 4,330 over 1903 and 10,316 over 1902. There were ten detentions for lunacy, being five less than in the previous year.

Grouped by sexes, the returns show that the convictions of males for indictable offences in 1904 numbered 6,377 or 94·42 per cent, and of females 377 or 5·58 per cent. Compared with the figures of 1903 there was an increase of 242 in males and a decrease of 29 in females. The summary convictions comprised 43,664 males in the total of 48,192 or 90·60 per cent, and 4,528 females or 9·40 per cent. In 1903 the male convictions were 39,511 or 90·08 per cent in a total of 43,862, and the female 4,351 or 9·92 per cent. The indictable and summary convictions of males increased from 45,646 in 1903, to 50,041 or 9·63 per cent in 1904, and of females from 4,757 in 1903, to 4,905 or 3·11 per cent in 1904. These figures are eloquent on the influence of environment.

The next table gives by sexes the number of convictions for indictable offences in the Dominion, according to ages, for the years 1903 and 1904.

Groups of Ages.	1903.		1904.	
	M.	F.	M.	F.
Under 16 years	1,005	33	663	34
16 years to under 21	906	85	1,104	65
21 years to under 40	2,573	181	2,909	164
40 years and over	787	66	866	68
Ages not given	864	41	835	46
Totals	6,135	406	6,377	377

Exclusive of the last group, whose number belongs in some unknown proportions to each of the others, the ratio of convictions for indictable offences of persons under 16 years of age was 15·87 in 1903 and 10·32 in 1904, of persons 16 years to under 21 it was 15·15 in 1903 and 17·31 in 1904, of persons 21 years of age to under 40 it was 42·10 in 1903 and 45·50 in 1904, and of persons 40 years and over it was 13·04 in 1903 and 13·82 in 1904. The only cheerful sign in these comparisons is the lessened ratio in the case of persons under 16 years; but the proportion of convictions of children is still large, and computed on the total population of provinces it is considerably higher in Ontario than elsewhere. Taking the two largest provinces of the Dominion, the

ratio of convictions to population for indictable offences in 1904 was 0·018 in Ontario and 0·007 in Quebec for persons under 16 years, 0·025 in Ontario and 0·023 in Quebec for persons 16 years to under 21, 0·063 in Ontario and 0·055 in Quebec for persons 21 years to under 40, 0·021 in Ontario and 0·016 in Quebec for persons 40 years and over, and 0·011 in Ontario and 0·004 in Quebec for ages not given. But it may be that the returns of convictions are not equally complete for the two provinces.

The next table gives the number of offenders under 21 years of age for Ontario and Quebec and the whole of Canada by classes of crimes for the years 1903 and 1904.

Offences.	Ontario.		Quebec.		Canada.	
	1903.	1904.	1903.	1904.	1903.	1904.
Larceny	759	647	385	359	1,417	1,296
Forgery and offences against currency	8	18	4	1	19	35
Aggravated assault	14	12	5	7	29	32
Assault and obstructing peace officers	11	8	17	33	30	46
Assault and battery	20	24	9	19	37	51
House and shopbreaking	82	88	65	40	190	158
Burglary	8	26	28	7	42	38
Shooting, stabbing and wounding	16	13	2	2	27	24
Other offences	129	104	49	36	238	186

In the offences of larceny and forgery, and offences against currency, aggravated assault, assault and battery, house and shopbreaking, shooting, stabbing and wounding, and other offences committed by persons under 21 years, the province of Ontario is credited with more than one-half the numbers for the Dominion, although its population is only 40 per cent of the whole, while Quebec attains nearly to the same unenviable rank for offences of burglary and assault and obstructing peace officers. The total convictions for persons of all ages in the Dominion for larceny were 3,337 in 1903, and 3,514 in 1904; for forgery and offences against currency there were 120 in 1903, and 152 in 1904; for aggravated assault there were 315 in 1903, and 258 in 1904; for assault and obstructing peace officers there were 446 in 1903, and 427 in 1904; for assault and battery there were 365 in 1903, and 441 in 1904; for house and shop breaking there were 335 in 1903, and 356 in 1904; for burglary there were 117 in 1903, and 94 in 1904; for shooting, stabbing and wounding there were 110 in 1903, and 111 in 1904; and for all other offences there were 1,396 in 1903, and 1,401 in 1904; showing increases in every class of offence except aggravated assault and obstructing peace officers and burglary.

For indictable offences against the person there were in the Dominion 1,612 convictions in 1903, and 1,605 in 1904; for offences against property with violence there

were 544 in 1903, and 552 in 1904; for offences against property without violence there were 3,751 in 1903, and 3,969 in 1904; for malicious offences against property there were 128 in 1903, and 100 in 1904; for forgery and offences against currency there were 120 in 1903, and 152 in 1904; and for all other offences there were 388 in 1903, and 377 in 1904.

The following statement gives statistics of indictable offences for the years 1903 and 1904 in all cases in which conviction was obtained, being in the aggregate 6,541 for 1903, and 6,754 for 1904:—

	1903.	1904.
Convictions—		
First conviction	5,192	5,295
Second conviction	760	843
Reiterated conviction	589	616
Sentences—		
With option of fine	1,263	1,302
Under one year in jail	2,267	2,454
One year and under two	269	367
Two years and under five	435	501
Five years and over	173	156
Life	1	.....
Death	8	14
Reformatory	325	232
Sentence suspended, &c	1,800	1,728
Occupations—		
Agricultural	249	296
Commercial	814	874
Domestic	193	273
Industrial	635	727
Professional	42	44
Labourer	2,472	2,795
Not given	2,136	1,745
Conjugal state—		
Married	1,548	1,679
Single	4,116	4,195
Widowed	104	120
Not given	773	760
Educational status—		
Unable to read or write	683	659
Elementary	4,931	5,122
Superior	142	143
Not given	785	830
Use of liquors—		
Moderate	3,838	4,085
Immoderate	1,922	1,825
Not given	781	844
Residence—		
Cities and towns	4,743	5,042
Rural districts	1,061	1,056
Not given	737	656
Birthplaces—		
England and Wales	377	486
Ireland	167	200
Scotland	128	85
Canada	4,310	4,390
United States	315	358
Other foreign countries	450	479
Other British possessions	23	18
Not given	771	738
Religions—		
Baptist	172	193
Roman Catholic	2,564	2,639
Church of England	985	1,040
Methodist	629	639
Presbyterian	467	523
Protestant	553	601
Other denominations	353	223
Not given	818	896

SUMMARY CONVICTIONS.

There were 48,192 summary convictions in 1904, an increase of 4,330. These offences consist of breaches of the peace, adulteration of food, assaults, infractions of various statutes, such as Fishery Acts, Masters' and Servants' Acts, Railway Acts and municipal and revenue laws, together with such other offences as vagrancy, drunkenness, keeping or frequenting bawdy houses, cruelty to animals, &c.

The following table gives by sexes the number of summary convictions by provinces in the years 1903 and 1904:—

Provinces.	1903.			1904.		
	Male.	Female.	Totals.	Male.	Female.	Totals.
P. E. Island	380	20	400	399	22	421
Nova Scotia	4,225	237	4,462	3,580	239	3,819
New Brunswick	2,134	144	2,278	2,527	97	2,624
Quebec	6,879	1,389	8,268	8,142	1,520	9,662
Ontario	17,492	1,620	19,112	18,346	1,437	19,783
Manitoba	2,505	177	2,682	4,535	355	4,890
British Columbia	2,567	519	3,086	2,265	604	2,869
The Territories	2,495	157	2,652	3,389	192	3,581
Yukon	834	88	922	481	62	543
Totals	39,511	4,351	43,862	43,664	4,528	48,192

Decreases are shown for British Columbia, Nova Scotia and Yukon. For all other provinces and territories there were increases, and the total increase of summary convictions was 4,330, or nearly ten per cent. In Prince Edward Island the increase was 5·25 per cent, in New Brunswick 15·19, in Quebec 16·86, in Ontario 3·51, in Manitoba 82·32, and in the territories 35·03 per cent. The decrease in Nova Scotia was 14·63 per cent, in British Columbia 7·03, and in Yukon 41·10 per cent. In British Columbia there was a decrease of 11·7 per cent for males, but an increase of 16·3 per cent for females; in New Brunswick an increase of 18·4 per cent for males, and a decrease of 32·6 per cent for females, and in Ontario an increase of 4·9 per cent for males, and a decrease of 11·3 per cent for females.

PUBLIC HEALTH.

No. 1.

REPORT OF THE DIRECTOR-GENERAL OF PUBLIC HEALTH.

F. MONTIZAMBERT, I.S.O., M.D.Ed., F.R.C.S.E., D.C.L.

October 31, 1905.

SIR,—I have the honour to submit this my annual report as Director-General of Public Health to October 31, 1905.

This year the usual threatenings of epidemic disease have continued, and in addition there have been special outbreaks of Asiatic cholera in Europe, and of yellow fever in the United States.

Strict measures, ordinary and special, have therefore been required for the sanitary protection of the country.

Frontier inspection for small-pox at threatened ports of the international border, and extra inspections at some of the maritime ports, have been maintained as the conditions to the south of us have seemed to require.

On the Atlantic side the outbreak of Asiatic cholera in Europe, especially in Prussia called for special precautionary inspections.

On the Pacific side careful inspection of all arriving Asiatics has been carried on throughout the year. This includes the testing of the temperature and the examination of the glandular regions. The special inspection of vessels from San Francisco spoken of in my last annual report, was discontinued from January 1 last, no case of plague having been reported in that city since the 1st of the previous March.

Circulars of warning and instruction were issued from time to time to the regular quarantine officers and to the customs officers, who are also ex-officio quarantine officers at all the unorganized maritime and inland quarantine stations.

Dominion Department of Public Health.—The Canadian Medical Association, at its meeting in Halifax, in August last, again expressed the voice of the medical profession of the country in favour of the creation and administration under one of the existing ministers, of a Dominion Department of Public Health. The special committee that had been appointed at the previous annual meeting, held in Vancouver, in 1904, laid before the association its report, as follows, the report being submitted by the convener of the committee:—

'As convener of your sub-committee *in re* the creation of a Department of Public Health as a Dominion measure, I have the honour to report that practically no advance has been made since we first presented your views to the federal government on this important question three years ago. Strong resolutions have been passed by your association containing the views of the profession on this matter, year after year, and they have been duly forwarded to the proper authorities at Ottawa, to say nothing of the personal representations of your sub-committee, conveyed to the government by way of deputation and personal interview. On the last occasion in which I waited upon the honourable the Minister of Agriculture, he pointed out to me that he was familiar with the views of our association, as contained in the several resolutions re-

ferred to above, and that it appeared to him to be unnecessary to call the committee to Ottawa to reiterate what we had so clearly laid before him. He assured me that the whole question had his entire sympathy and that he trusted to see such a scheme as had been outlined to him brought into operation. And he further said that it was his intention to bring the matter again to the attention of the Prime Minister, he hoped, at a date sufficiently early to enable him to give something rather definite for our meeting at Halifax. Your committee feel that they have done what they could to induce the government at Ottawa to create a Department of Public Health, under one of the existing ministers, in order to place this important branch of the public service on the same footing as it stands in nearly all progressive countries. We regret, however, to be obliged to report that so far our efforts have been unavailing, and as we believe that a more powerful and influential committee is needed from this association to more seriously impress the government with the great importance of this question, we respectfully ask to be discharged.'

In presenting this report, Dr. Powell, of Ottawa, the convener, said that in accordance with a resolution passed in London last year, the committee had interviewed the government, and he was sorry to report that it could not give them any assurance that the resolution in the matter could be practically considered. He said there seemed to be a general fear lest such a department should interfere with the autonomy of the provincial boards, but he had pointed out that there was no fear of that, as many matters would come up for consideration that could not be touched by the provincial authorities. He instanced the medical treatment of Indians, which was under the supervision of the Minister of the Interior, and the quarantine department, under the control of Dr. Montizambert. There were such matters besides, as sickness on trails and in camps, which could be dealt with by a federal department, and he did not see that there was the least need that it should in any way interfere with the provincial departments.

Dr. Fagan said he quite agreed with Dr. Powell's remarks, because, as a provincial medical health officer, he had often been faced with the very same difficulties of which he had spoken. Cases were brought to his notice that were not within the range of the provincial department, and when he applied to Ottawa he was told that they could not deal with them there.

The following resolution was then carried unanimously: 'That the Canadian Medical Association regrets that the Canadian government has not seen fit to carry out the resolution of this association in favour of the creation of a federal health department, and be it further resolved, that the association continue to press this matter before the government, and that the special committee in charge of the same be reappointed and requested to continue its efforts to this end, and that copies of this resolution be sent to the Prime Minister, the Minister of Agriculture and the Secretary of State.'

In England the demand for a Ministry of Public Health is being pushed with vigour, and appears to be reaching the sphere of practical politics.

With regard to a health department for India, the *Sanitary Record,* London, October 13, speaks as follows, under the heading of 'A Health Minister for India':—

What is denied to the homeland has been granted to our great dependency in the east. The papers to hand last week contain extensive articles on the new sanitary order which has been issued with the sanction of the Secretary of State for India. By it an Imperial sanitary commissioner is appointed, the first to fill the office being Major J. T. W. Leslie, transferred from the secretaryship of the Indian Medical Service. Among the duties defined for the new officer are that he shall direct and inspire the measures taken for the improvement and reorganization of the existing sanitary machinery, and will also organize research work in connection with health problems. The scheme already sanctioned by the Secretary of State provides for a central laboratory devoted mainly to original research of a general character and to

the manufacture of certain curative *sera*. In each of the larger provinces there will be a provincial laboratory, the primary functions of which will be to conduct diagnosis and special research connected with local conditions. All the laboratories will be under the control of the sanitary commissioner, but the government of India disclaim any intention of relieving local governments of the direct control and responsibility which they have hitherto exercised in sanitary matters or of weakening their authority over provincial sanitary establishments. The sanitary commissioner will not encroach in any respect upon the authority of the local governments over provincial matters, but he will be empowered to consult and confer with them informally upon matters connected with sanitation, and will, in this respect, occupy a position analogous to that of the Director General of Education. The Governor General in Council expresses the hope that by the measures now taken and the further reforms in contemplation there will be effected improvements of the general conditions of life in India, with the willing co-operation of the people themselves. Thus the authorities have recognized the importance of a separate department for sanitary administration, and we trust the time is not far distant when a similar decision will be made at home.

In Pennsylvania Governor Pennypacker has signed the bill passed by the Legislature at its recent session abolishing the State board of health and establishing in its stead a department of health whose head shall be clothed with almost unlimited authority in safeguarding sanitary conditions in the state. The commissioner of health contemplated by the new Act must be a physician of at least ten years' experience, and he is to receive an annual salary of $10,000. He shall be aided by an advisory board of six members appointed by the Governor, four of whom shall be physicians and one a civil engineer, to serve without salary; the state, however, paying their necessary expenses. The state shall be divided into ten health districts, each in charge of a physician of at least five years' experience, who shall receive an annual salary of $2,500.

Deputy Minister by Statute.—Your Director General of Public Health, who is also by Order in Council the sanitary adviser of the Dominion government, and who has had the rank of a deputy minister by Order in Council for some years, was by an Act at the last session of the Dominion parliament, given the rank of a deputy head of a department.

Bubonic plague.—This disease has occurred during the year in Arabia, Argentina, Australia, Brazil, Chili, Egypt, Formosa, Great Britain, Hawaii, India, Japan, Mauritius, Panama, Peru, Philippine Islands, Russia, Siam, Straits Settlements, Turkey and Zanzibar.

In his Treatise on Plague, Dr. Simpson says, 'Few thought it possible, when plague broke out in Bombay in 1896 after an absence of 200 years, that the disease would not be controlled, checked and stamped out in a short time. It was a rude awakening when the deaths began to mount up to a few thousands and to find the old scenes associated with plague epidemics reappear. The closed houses, the deserted streets and nearly half of the population of Bombay fleeing panic stricken from the city, testified to the fact that plague has lost none of its old terrors, and recalled the condition of affairs described in the old epidemics of plague. Later, when, owing to the decline of the epidemic, confidence was restored and the people had in consequence returned, there were congratulations as to the lightness of the attack as compared to the mortality in the great epidemics of the past; yet the next year, and the next, and every year since 1896, the disease has recrudesced in the city of Bombay, and the number of deaths is fast mounting up beyond the mortality of any epidemic of plague in any single city in the past, with the exception of those of Constantinople and Grand Cairo. And still the disease continues. Plague has moreover spread from Bombay to the Bombay Presidency, and from the Bombay Presidency to a larger portion of India. Slow in its progress, it has steadily advanced,

and now the 30,000 deaths from plague which occurred in India in the first year, and which created so much alarm, has reached during the past two years over three-quarters of a million per annum. In 1902 the number of deaths from plague in India was 833,000, and in 1904 it was over a million, being 1,040,429. The total number of deaths in India officially recorded from plague since 1896 was, up to the end of December, 1904, three millions, one hundred and fifty thousand.

Cases of plague were brought to several of the ports of Great Britain during the year. There was a small outbreak at Leith in May last.

On Friday, May 5, a labourer was admitted to the Leith Fever Hospital, said to be suffering from enteric fever. On Sunday, May 7, the symptoms seemed rather to point to typhus fever, and he was treated with abundance of fresh air. On Tuesday, May 9, a swelling was found in the left groin. Some fluid removed from this swelling by aspiration showed on bacteriological examination plague bacilli. This was verified by Dr. Buchanan, of Glasgow, and other observers. On Monday, May 8, a girl of three years of age, the daughter of the labourer above referred to, was also sent into hospital, said to be suffering from enteric fever. This child had sickened on Saturday, May 6. On admission, she had a swelling in the left groin, and other marked symptoms of bubonic plague. On Wednesday, May 10, the mother and another child, a son of six years of age, were admitted, obviously showing plague symptoms. The boy had a swelling on the left side of the neck of long standing, but this swelling had become more acute at the time of admission, and he had other signs of the disease.

No further case of plague has occurred either among the contacts or the general community. The houses of the contacts have been thoroughly disinfected. Notwithstanding the very extensive destruction of rats, no evidence of plague has been found in any of those destroyed. The source of the outbreak, therefore, remains a conjecture.

In South America, since the year 1903, when the bubonic plague first made its appearance on the west coast of South America, it has never entirely disappeared. During this year there seems to have been a recrudescence, particularly in the southern part of Arequipa, Peru. In Lima there were one or more cases discovered daily, Though the type of the epidemic seems to be comparatively mild and not extremely contagious, nevertheless it continues. Should it get a footing in the interior of the country, it would probably be more fatal than on the coast, as the hygienic habits of the population there are worse than those of the coast. The disease has made terrible ravages at Pisagua, Chile, and refugees from that town assert that for some time before their departure the deaths there had ranged from ten to thirty a day, and the authorities were then unable to enforce burials. Bodies were thrown into the streets and spread contagion. But little headway had been made in the fight on the disease, and it seemed as though the entire population of that Chilean port might be exterminated by the plague. Many persons had been shot down by the soldiers on guard while attempting to escape from the stricken city.

In Hong Kong and in British South Africa plague has been present during the year to much the same extent as during the previous year.

In the *Lancet* for June 10, 1905, appears an interesting contribution by Dr. A. M. Elliot, late Special Plague Officer, Bombay government, whose experience includes some 8,000 cases of plague. In a short bacteriological resumé of that disease, he states, as the result of his investigations, that the bacillus is present only in small numbers in the lungs, except, of course, in the pneumonic form. He finds, too, that the bacillus disappears from the buboes as suppuration becomes fully established. These points are of importance as bearing on the relative infectivity of the various types of plague, and support Prof. Simpson's opinion that the bubonic form is but slightly infective. In support of his view that the lymphatic system is always the seat of local reaction from the invading bacillus, Dr. Elliott says that in over 400 necropsies he has invariably found some group of glands infected.

Referring to the transmission of plague to man from domestic animals, Dr. Elliot differs from Prof. Simpson as to the susceptibility of pigeons and fowls, as he has, so far, been unable to effect either experimentally, though his control guinea-pigs have died of plague within the usual period. He gives two instances where he cultivated a bacillus corresponding in every way with that of plague, from cervical buboes in cats which were in association with human cases.

Speculating on the possibility of explaining the recrudesence of plague by a saprophytic existence of the bacillus, Dr. Elliot describes an experiment in which soil from an infected house was kept in a tin-lined box for a month, with precautions against infection. Rats were then introduced, and their food was boiled to prevent infection from that source, but in from three to five weeks all the four rats had died from plague. The experimenter gives this for what it is worth, and it is of interest in that it goes to support the view that infection may be present in the soil, and shows that it may retain its virulence there for seven weeks.

The greater part of the article is devoted to a consideration of the channels of infection, and the writer evidently believes strongly that infection through the skin is relatively very frequent. The greater incidence of inguinal buboes among adult males is attributed to the sitting (or rather squatting) posture of the native, whereby the perineum and neighbouring parts are kept in a dirty state, and the skin on the inner aspect of the thigh is maintained in a sodden condition. Dr. Elliot considers that women and children squat less often, and that the inguinal glands are less frequently affected on that account. Shaving of the pubes and axillæ in many cases affords opportunity for entrance of the bacillus through cuts. The higher percentage of axillary buboes among women is explained by the proximity of the nipple, and the habit of the women of wiping the hands on their clothing in that region. The high proportion of cervical buboes among children is suggested to be due to their putting everything into the mouth and to dentition.

Dr. Elliot believes that infected food is responsible in some cases, and gives post-mortem evidence in favour of this view in cases where the only symptom was a severe diarrhœa. He regards the higher fatality of certain types and of buboes in certain situations as due to the wider mesh of the lymphatic tissue at the point of entrance of the infective material, whereby the bacillus more readily reaches the blood stream and a septicæmic condition results more rapidly.

Dr. Elliot's further contribution on the modes of transmission from man to man may be looked for with interest.

E. H. Hankin writes as follows:—

'Thus, so far from the patient's dejecta being the main source of infection, known facts indicate that only in a small proportion of instances does the microbe in the dejecta pass into the condition in which it produces infection of human beings in Indian plague. Facts are even compatible with the supposition that this practically never occurs apart from certain pneumonic cases. The problem of the means of the spread of plague is by no means solved by a reference to rats. Though in some cases there can be no doubt that they play a part in the spread of the disease, other cases that have been brought forward indicate that the plague can spread and remain attached to a locality apart from this agency.

'Historical evidence teaches us that the most virulent outbreaks recorded have occurred among populations that habitually wear boots and shoes, rather than among populations that go barefooted. This fact militates against the idea that infection is due to the entry of the microbe through fissures in the skin of the feet. Still less probable is it that this is a usual mode of entry of the microbe for rats, which animals, as we may well believe, but rarely cut their feet by treading on stones or thorns, and are by no means so liable to wounds from other causes as they sometimes are to plague. Laboratory experiments show that the plague microbe loses its infectious power by repeated passages through rats by subcutaneous inoculation. Should these

experiments be further substantiated, they would furnish good grounds for doubting whether contagion from rat to rat, or from rat's dejecta to rat, is the usual means of spread of the disease among these rodents, and to a less extent from rats to men. The apparently spontaneous limitation of outbreaks of pneumonic plague caused by direct infection indicates that the plague microbe may undergo a similar diminution of its infective power by repeated passages through human beings.

'Thus it is improbable that the true "nidus" of the plague bacillus is either dirt, or rats, or men; though either of these agents may be concerned in the exportation of the disease from one locality to another, or may be responsible for a few and isolated attacks of the disease, and must, in any event, be regarded as suspect from the practical standpoint.

'The general immunity to infection of attendants in plague hospitals makes it improbable that bugs and mosquitoes cause human infection by biting while their proboscides are still fouled with the blood of septicæmic patients. It is difficult to see why the proboscis of the flea should be more liable to transmit infection in this way, whether we are dealing with fleas that normally bite human beings, or fleas liberated from infected rats.

'Simond has suggested that fleas deposit dejecta at the moment of biting, and that the microbe contained in such dejecta is afterwards accidentally rubbed into the bite, and so causes infection. But if fleas can be dangerous in this way, why should not other biting insects that are present in plague hospitals similarly infect the attendants? Further, it may be doubted whether this theory adequately explains the prolonged incubation period in the locality and persistence of the infection so often observed in outbreaks of plague.

'The only view of the matter that appears to me likely to lead to an explanation of the facts is that the true "nidus" of the plague infection is some species of flea in which the microbe causes a slowly developing infection that at length renders the insect capable of transmitting the disease, and in which insect the virus can retain or regain its virulence.

If Simond's view were true, namely, that the flea merely retains the microbe in its intestine and passes it out with its dejecta, one would expect fleas to be most virulent immediately after, or soon after, ingesting the blood of infected rats. The theory now put forward is that the microbe developes in the flea, and only after a lapse of time is in a position to reach the proboscis in the act of biting. This theory obviously presupposes an interval between the time of reception of the virus by the flea and the development of its capacity to pass this virus on to other animals. As explained above, such an interval is usually observed in outbreaks of plague.

Changes in the habits of fleas as the rat population dies off may explain cases in which rats appear to play different parts in the spread of the disease at different periods of the outbreak.

Differences in the habits of fleas in different localities may be the cause of abnormal outbreaks in which certain susceptible species of animals temporarily or permanently escape. The class of facts here referred to, and which have been described in earlier paragraphs, are impossible to explain on the theory that plague transmission is simply a chance passage of the microbe from infected dejecta to accidental cuts or scratches on the bodies of susceptible animals.'

Dr. Ashburton Thomson, from his observations in the epidemic of 1902 in Sydney, concludes that the flea must be able to communicate the virus 'many hours, and even some days after it has received it.' The facts brought forward in this paper suggest that in India the flea may retain the power of transmitting disease for weeks or even months. Simond has suggested that the retention of the infection by fleas may be the cause of recrudescences of the disease, which, as he shows, usually occur at the interval of a year after the first appearance of the outbreak.

'As evidence that the plague microbe developes within the body of the flea, I can only quote the following observation of my own made during the above-mentioned plague outbreak in Agra. In April, 1901, a rat was brought to me that had been found dead in the grain dealers' quarters in Agra shortly after the first human case of the disease had occurred. No trace of the plague microbe could be found, either by microscopical examination or by culture in any of the tissues of the rat. On the rat, however, I found a living flea. This I caught and placed in a tube of sterile bouillon. The tube was violently shaken. The flea was then taken out and placed in a second tube of bouillon and similarly treated. The process was repeated several times, with the object of removing as far as possible saprophytic bacteria that might be present on the surface of the flea. After the above treatment the flea was dissected, with strict aseptic precautions, under a dissecting microscope. The stomach was taken out and cut in two pieces. One half was placed on agar-agar, and from it a pure culture of plague was obtained (as shown by involution forms on salt agar, &c.). The other half of the stomach was subjected to microscopical examination. The only microbes visible were bacilli with rounded heads identical in appearance with those of plague. These were arranged in clusters of about a dozen individuals each, and appeared to be embedded in the tissues of the stomach wall. No bacilli were observed in the liquid contents of the stomach. The arrangement of the bacilli in clusters obviously suggests that they were engaged in reproduction *in situ*.'

Cholera.—This disease has appeared during the year in Austria, China, Egypt, Germany, India, Japan, Persia, Philippine Islands, Poland, Russia, Straits Settlements and Turkey.

This disease suddenly appeared in Prussia in August last, amongst Russian emigrants in Hamburg awaiting transportation to America. Sixty or more cases marked its first outbreak and were rapidly followed by others, rising by the 11th of this month to 261 cases, with 89 deaths.

Epidemic cholera has been slumbering in Russia for at least a year past, and several cases of suspected cholera have occurred in Moscow among travellers from Poland. It will be remembered that last April the Russian government summoned a large number of medical men to a conference at Moscow. This conference was to have considered the means which were to be taken to check the spread of the epidemic, but owing to political unrest in Russia it achieved little or nothing in this direction.

Whether cholera in Russia is connected with the outbreak which occurred in Persia last October, it would be difficult to say. The recently published report of Major Sykes on the trade of the Kerman consular district incidentally furnishes a graphic account of the circumstances of the cholera epidemic which broke out at Kerman in October last. It was originated by a pilgrim from Meshed, in the north-east of Persia, who was ill and died of cholera a few miles outside the city, to which he was returning. His friends washed his body in the neighbouring stream, and brought all his clothes into Kerman to be sold, a proceeding which was rapidly followed by the appearance of the disease in epidemic form. A complete panic immediately ensued, the first to yield to it being the authorities of the city. The entire Persian official community ran away in a body followed by every one in the place who could get hold of a horse or conveyance to take him away into the country. As a result the surrounding villages immediately became affected by the disease, which was thus rapidly disseminated about the neighbourhood. In the city business was brought to an absolute standstill, the carpet trade, for which it is famous, suffering especially.

The only bright side of the picture, Major Sykes relates, lay in the heroic labours of the doctors of the Church Missionary Society, who stayed to fight the epidemic. Fortunately the cold weather was at hand, and at the end of a couple of months the worst was over. Major Sykes points out the crying necessity of properly trained Persian medical men and the equal need of training the people to follow a few simple hygienic rules.

Epidemiologists have for some time been watching this gradual advance of cholera from the east on one of its periodical incursions into western Europe. The movement began in the latter part of 1899. Eastward the disease advanced from India rapidly, invading China and Japan. From Hong Kong it passed to the Philippines, working havoc in Manila and the provinces despite the best efforts of the medical officers of the Army and Marine Hospital Service. Its progress westward through Arabia and Persia into Russia has been more gradual. Cholera appeared in Mecca in 1902, and thence spread throughout the Mussulman world, being heard of in Egypt, Asia Minor and Persia, finally establishing itself firmly in Teheran. From this point it followed the caravan routes into Anatolia, Transcaucasia and Transcaspia, thence reaching the banks of the Volga. Here it rested for nearly eighteen months, being restrained by some mysterious influence, the nature of which students of epidemics have never yet discovered, and only now has it resumed its march westward. Why should it have remained so long in Russia and then suddenly crossed the frontier? Raftsmen were coming down the Vistula past Thorn and Kulm, and emigrants were leaving Poland and western Russia for Hamburg and Bremen, sailing thence for New York, but the disease remained behind. The Russian health officials did as little to throttle the epidemic then as they are doing now, and the communication between the Volga, where the cholera hibernated, and the Vistula down which it is now journeying into Prussia, was just as free in the summer of 1904 as in that of 1905, but the infection refused to spread. Suddenly it takes a start and Europe awakes to the peril of a cholera invasion. Epidemiologists tell us that the conditions which retard or accelerate the progress of this disease are climatic conditions, but this is only a term to cloak ignorance. Pettenkofer's subsoil water theory is just as satisfactory and no more intelligible. That there is some influence which affects the virulence of the comma bacillus, or which determines a greater or lesser power of resistance in the human subject, must be admitted, but whether this influence is atmospheric or telluric or neither, it still remains a mystery.

Absolute authority has been given to the sanitary authorities in the districts of Kulm, Thorn, Graudenz, Marienwerder, Stuhm, and Schwetz, for the purpose of preventing the introduction and spread of cholera. Two Russian raftsmen died of the disease at Kulm, and as they were engaged in the Vistula river traffic, the source of the infection is assumed to be somewhere up the river in Russian territory. All bathing houses along the river have been closed, and the water supplies from the river for adjacent towns have been sharply shut off. The inhabitants are obliged to import water or to use that taken from the wells.

The cases at Hamburg would seem to have no direct connection with those which have occurred in West Prussia. The first case at Hamburg was in a Russian transmigrant, and its nature was only recognized after post-mortem examination on August 27. Great improvements have been introduced into the water supply and sanitation of Hamburg and Altona since the great outbreak of cholera in 1892, and there seems good reason to hope that the precautions taken will prevent the establishment of an epidemic in that city. Meanwhile, embarkation of Russian transmigrants has been stopped; the United States Board of Emigration has given orders that all steerage passengers from Bremen and Hamburg will be kept under observation for six days before embarkation, and has despatched two medical inspectors to Hamburg.

The history of the present outbreak is typical. It began in Arabia and spread across Syria, Mesopotamia and Persia into Russia; then it went up the Volga into the heart of that empire. Sanitation is little known among the Muscovites and the death rate in their cities is always so high that what would be considered an epidemic in most countries attracts little attention, particularly if the people afflicted are the labouring classes. It was carried into East Prussia, but there it found competent medical barriers and has since been fought intelligently. On September 1 there were forty-three cases in Germany, all in East Prussia save one in Hamburg. The im-

perial government at once ordered all emigrants from the country to be kept under quarantine regulations until it was certain they were healthy, and the United States Marine Hospital Service sent its inspector at Naples to Hamburg and ordered another inspector from Philadelphia to go to his assistance. On September 2, a second case was discovered at Hamburg and nineteen deaths were reported. On September 4 the number of cases had risen to sixty-six, and the deaths to twenty-three, and on September 5 these figures were seventy-seven and twenty-four respectively. The disease was brought into the country by Russian raftsmen who came down the Vistula river, and by a party of eighty emigrants, one of whom was the first man who died in Hamburg. As soon as this fact was known, orders were issued closing all restaurants along the Vistula, except in towns, so that the rivermen can be kept under better supervision, and facilities were provided for treating cholera patients in many parts of the empire.

Circulars of warning referring to the appearance of cholera in Germany were sent to all your Atlantic quarantine officers, and the customs officers at the minor Atlantic seaports.

In Poland during the period from the 5th to the 11th of this month, forty-seven cases of cholera, with twenty-four deaths, were reported.

In the Philippines, Dr. Heiser, chief quarantine officer, reports that while the total number of cases of cholera for the week ending September 23 is slightly in excess of those reported for the preceding week, yet the situation is not considered serious, and there is every reason to believe that the disease will be stamped out very shortly in the city of Manila. One very disquieting feature is the continued presence of cholera on the watershed of the Maraquina Valley, above the intake of the city water supply. Every effort is being made to guard against pollution, three troops of cavalry being engaged on this work. Dr. Heiser states that considerable anxiety was felt during the early part of that week on account of a report from Nueva Caceres that one case of cholera had made its appearance at that place. During the cholera outbreak of 1902 the disease appeared at Nueva Caceres almost simultaneously with its appearance at Manila, and since travel between Manila and Nueva Caceres during the present outbreak was practically impossible, except that which underwent the regular quarantine of five days, it was not likely that the disease could have been carried from Manila. Should this case have been correctly diagnosed, it would appear to afford additional evidence that the disease is endemic in the Philippines. No additional cases have occurred, however, and this fact will appear to throw considerable doubt on the diagnosis. Cholera in the provinces is still confined to about the same limits. The cases at Taytay have markedly increased until they have now reached a total of 56 cases, with 48 deaths. The total number of cases in the city of Manila since the outbreak has been 195, with 168 deaths. The number of cases in the provinces has been 260, with 213 deaths.

Small-pox.—This disease has as usual prevailed extensively this year, appearing in Africa, Argentina, Austria, Belgium, Brazil, British Guiana, Canada, Ceylon, Chile, China, Columbia, Cuba, Denmark, Ecuador, Egypt, France, Formosa, Germany, Gibraltar, Great Britain, Greece, Hawaii, India, Italy, Japan, Mexico, Netherlands, Norway, Panama, Peru, Philippine Islands, Porto Rico, Russia, Spain, Straits Settlements, Switzerland, Sweden, Turkey, Uruguay, United States, Venezuela, and the West Indies.

Although this disease has ceased to exist as an epidemic in the United States, there have been during the year, from time to time, such threatening outbreaks of the disease close to the south of our international frontier, as to require temporary local inspecting officers at various points. Such officers have been on duty for such periods as seemed to be requisite at Canso, N.S., Owen Sound, Thessalon, Bruce Mines, Sault Ste. Marie, and Fort Francis, Ont.; North Portal, Sask., and Gateway, B.C.

Cases of this disease were brought to some of your quarantine stations, and it has in each case been stamped out there.

Few people nowadays are unwise enough to question the protective value of vaccination. An additional proof of its value—if further proof be necessary—is to be found in the report of a small-pox hospital in one of the neighbouring states, from which I quote as follows: 'During the past four years about 1,000 medical students, 60 physicians, 100 nurses, and over 100 servants have been freely exposed to small-pox in the wards of the municipal hospital, the medical students being admitted to study the cases. Of this group, approximately, 1,250 individuals, only one contracted small-pox. This individual, a medical student, descendant from an anti-vaccination family, through purposeful deception, gained access to the small-pox wards, contracted the disease, and was so seriously ill that for a time his life was in extreme jeopardy.'

Further experience seems to confirm the claim for chloroform instead of glycerine for the purification of vaccine put forward by Dr. Alan B. Green, of the English Government Lymph laboratories, London, Eng. The health commission of Chicago reports: Emulsions of vaccine pulp exposed for a time to chloroform vapours after the method devised by Dr. Alan B. Green of London have been found by Dr. J. F. Biehn, director of the Department Laboratory of the Chicago Health Department, uniformly free from all foreign organisms except those causing vaccinia. This vaccine was used by a physician five days after it was removed from the calf. One day was required to prepare it, one day to ship it to Chicago, two days to test it bacteriologically, and one day to send it to the clinician who made the clinical test. Ten days after its receipt the clinician reported that the chloroformed vaccine had given 100 per cent of successful primary vaccinations. The most important advantage of the chloroform process is the rapidity with which vaccine lymph may be purified. Purifying by the action of glycerine requires from forty to sixty days; by chloroform, four hours.

Dr. Green, who devised this method of purifying vaccine pulp as it is collected from the calf, says, in a recent report, that since April, 1903, the date of his preliminary note on this subject, a large number of vaccines have been treated. These lymphs have been freed from their non-spore-bearing extraneous bacteria within a period ranging between one and eight hours after their collection from the calf, and have, subject to the usual tests, been issued for general vaccination purposes about two weeks after collection. Their use, he claims, has resulted in high 'case' and 'insertion' success.

The rapidity with which vaccine lymph can thus be purified obviates the danger of a vaccine famine when a small-pox outbreak creates an unusual demand for vaccination.

Another advantage is that the life of the vaccine—that is, the period during which it remains active—is materially prolonged. Glycerine is intimately mixed with the lymph and continues its sterilizing action until the vaccine becomes inert. The chloroform is withdrawn as soon as the lymph is purified and there is no further sterilization.

A still further advantage of this new process vaccine, and one which will be duly appreciated by practical vaccinators who have to deal with large numbers, is the rapidity with which the chloroform vaccine dries when applied.

Yellow fever.—The most notable event of the year in connection with this disease has been its reappearance in the southern part of the United States. The stress of the epidemic has been most felt in the State of Louisiana and in the city of New Orleans. In that city there have been 3,383 cases and 455 deaths.

The first intimation to the health authorities of yellow fever in New Orleans was had on the afternoon of July 12, when two physicians reported orally to the president of the State Board of Health in his office two cases of illness resembling, in their judgment, yellow fever, one case being reported after death.

The plan of campaign adopted by the Board of Health from the beginning was based on the mosquito conveyance of disease, and the system was improved from day to day as the men employed became more familiar with their duties.

For the first time since yellow fever appeared in New Orleans the noon bulletin of October 28, covering the sixteen hours preceding showed that there were no new cases and no deaths.

The yellow fever epidemic is so nearly at an end that it can safely be said that science has won a distinct victory after one of its greatest battles. The attitude and the effort of the community have been admirable and thoroughly helpful to the enlightened and vigorous course of the officers of the United States Public Health and Marine Hospital Service. Action along the lines pointed out by the mosquito theory of infection has proved to be absolutely effective. This is demonstrated by comparisons with the epidemic of 1878. The two epidemics were discovered late in July, and they ran a very similar course up to three or four days after the beginning of the organized fight this year. Thereafter the cases decreased in 1905 as against a great increase in 1878. In all the south there have been in 1905 less than 9,000 cases and not over 1,000 deaths, while in 1878 in New Orleans alone, with half its present population, there were 4,000 deaths. In 1905 outside New Orleans it has been shown, in town after town, that the epidemic recedes uniformly when there is thorough application of the methods deduced from the mosquito doctrine. Whenever the community has been reluctant to adopt measures demanded by modern knowledge, there the epidemic has been most severe.

Under the heading of the Mosquito as a School Master, *Charities* says:

'One female Stegomyia, with an old oyster can in your back yard, with a little water in it, can hatch out 200,000,000 mosquitoes in one year; clean out your cans, your broken bottles and your tubs.'

This is a sentence from a veritable stump speech before one of the hundred meetings held throughout New Orleans the past month. It shows not only the thoroughness of the campaign against infection, but the picturesque way in which the subject has been driven home in one of the most remarkable educational movements of the decade. Practically an entire city has been converted to the mosquito theory of the transmission of yellow fever. The lecturer's stereopticon has been as mighty in the muster of arms as the bacteriologist's microscope. It has been a story of 'inspection, fumigation and widest education,' to use the words of the *Picayune,* and the list of meetings announced in a single issue, sounding as they do like the marshallings of a political campaign, gives an idea of the vigor with which this gospel of belief and of works has been preached in churches and halls, and synagogues and markets; before Italians and negroes, and women's club and ward organizations.

Professional recognition will come to the Marine Hospital Service and to the local health officers for their technical sanitary work. *Charities* would compliment them further upon the spirit with which they have welcomed and engaged public cooperation.'

The Mosquito Transmission of Yellow Fever.—At the annual meeting of the American Public Health Association, held in Boston, Mass., during last month, a committee consisting of Drs. John Guiteras, Frederick Montizambert, P. H. Bailhache, James Carroll, William Bailey, and Eduardo Licéaga, presented the following preambles and resolutions:—

'*Whereas,* The results obtained during the present epidemic of yellow fever in New Orleans by the methods of mosquito extermination, and by the prevention of the access of the mosquito to the patients, have been far in advance of the results obtained by the older methods; and

'*Whereas,* It has been possible by the new methods to hold in check and gradually to reduce an epidemic that has taken a firm foothold in the midst of the largest non-immune population that was ever exposed to yellow fever; therefore, be it

'*Resolved*, (1) That the association sees in these results a further confirmation of the view that yellow fever is naturally transmitted only by the bite of an infected mosquito. (2) That the association is of opinion that an efficient plan of defence against the propagation of yellow fever at the beginning of an epidemic can be easily established upon the basis of this doctrine. (3) That the successful carrying-out of such plan depends upon a thorough understanding of the mosquito doctrine by the people, and the support that they may give to the prompt and frank reporting and to the proper handling of the first cases, and of all suspicious cases. (4) The association wishes further to congratulate the Public Health and Marine Hospital Service for the brilliant work done by Dr. Joseph H. White and his colleagues in New Orleans, and to urge upon all concerned that the said service be called upon to take charge permanently of maritime quarantine along the Gulf Coast.'

These resolutions were adopted.

Scarlet fever.—In a recent article on this disease the *Journal* of the American Medical Association says:—

The treatment of the eruptive fevers by red light is no new proceeding, as there is some evidence that the Chinese and also some European nations employed it centuries ago. That they applied the treatment in the form now suggested seems doubtful, and there is evidence that they neglected to exclude ordinary light from the sick room, and that the hanging of the room with red draperies, and sometimes wrapping the limbs in red cloths, constituted the red light treatment of early days. Toward the end of the last century the work of Finsen put the matter on a scientific basis, and renewed the interest in this form of treatment. The philosophy of the treatment is based on the well-known fact that the so-called chemical rays in light, the blue, violet and ultra-violet, are capable of setting up inflammation in the healthy skin, and therefore are certain to aggravate the inflammation in a skin already diseased from some other cause. Finsen suggested the use of the red light treatment in small-pox particularly, and the results reported have varied, though they have been most encouraging, when the reporter closely followed Finsen's directions. This method of treatment has also been followed with some success in erysipelas, especially by Krukenberg, who has reported both improvement in the skin condition and rapid decrease in the temperature.

Quite recently Cnopf of Nürnberg has reported some results with the red light treatment of scarlet fever, which are distinctly encouraging. The method of applying the treatment in these cases is important, as all daylight must be permanently excluded until the eruption of the disease has completely disappeared. The windows for their lower two-thirds should be covered with some tissue completely impermeable to light, while the upper one-third should be covered with some ruby red silk. At night the room should be treated as a photographic dark room and only lights with red shades should be allowed. The importance of completely excluding everything but the red rays is demonstrated by some of Cnopf's experiences. He found that even after the scarlatinal rash had apparently disappeared exposure to daylight for two or three minutes sufficed to bring it back. He was compelled, therefore, to make this test in all cases before allowing patients to be subjected to ordinary light. The effect of the red light treatment on scarlet fever is twofold. The fever, which under ordinary treatment usually persists until the rash fades, falls, almost by crisis, and reaches normal in three or four days instead of in seven or eight days, as is the case under ordinary treatment. The skin lesion is also markedly affected, the red colour so characteristic of the disease gradually fading. The complications of the disease are apparently not affected, as in several of Cnopf's cases secondary angina or pneumonia served to cause an increase in the fever as usual.

The question naturally arises whether it is the red light or merely the exclusion of all light which is responsible for the changes noted by Cnopf. The query is an old

one. Years ago it was noted that exclusion of all light from small-pox patients led to less pitting than daylight treatment. Cnopf, however, thinks that the mere exclusion of daylight is not the responsible agent, but that the red rays have an actual curative effect. How this effect is produced he does not pretend to say. However much we may be lacking in explanations of these observations, and however much we may doubt the actual value of the treatment, the success achieved seems to indicate that the method is worthy of more extended trial.

Considerable interest was aroused not long since by Mallory's description of certain protozoön-like bodies which he had observed in the epithelial cells and the lymph spaces of the skin taken from patients who had died of scarlet fever. He had been unable to find these in the living patient. This discovery was hailed as a possible contribution to the etiology of the disease, and a number of investigators have since then busied themselves with the question along the lines indicated by Mallory. Duval obtained similar bodies from the blisters of scarlatina cases, and now C. W. Field (*Journal of Experimental Medicine,* Vol. VII., No. 4), has published the results of his investigations dealing with a similar condition not only in scarlet fever, but also in measles and other skin rashes. Field comes to the conclusion, based on an extensive series of observations, that the bodies described by Mallory are part of the protoplasm of the epithelial cells, which has been so changed in its chemical nature that its staining reaction differs from that of the surrounding protoplasm. The small round extra-cellular bodies found in the living patient may arise from degenerating cells, but this origin the author does not assert without reserve. In sections of control and normal skin, the nuclei of the epithelial cells were often seen to be indented by the cell protoplasm, giving them an appearance similar to those indented by Mallory's bodies. It would seem that if these bodies were protozoa, they would have been found in the sections from both the living and the dead skin of scarlatina and measles patients, as they were present in the blister fluid. Their occasional absence seems more suggestive of a degeneration than of a living organism. This view is also borne out by the fact that in one instance they were not found immediately after death, but were present in another specimen from the same case removed 24 hours later. Another circumstance of interest that apparently supports the idea that bodies found in the blister fluid are the products of degeneration and cytolytic activity, is the fact that these were found in the antitoxin rashes as well as in those of scarlatina and measles. Field's observations demonstrate quite clearly that a great majority of these protozoön-like bodies arise from degenerating cells and the differentiation between one of the latter and a true protozon by the morphology and the staining reaction alone will remain a difficult matter. Although it would seem from these facts that the bodies described by Mallory may be what Field claims them to be, nevertheless they may be specific accompaniments of these diseases, and even if we cannot ascribe to them any pathogenic characters, it may be yet be possible that their demonstration will prove of some assistance in the diagnosis of these cases.

Beriberi.—The *Medical Record* reports that at a recent medical meeting Dr. Tertius Clarke read a paper on this subject, discussing the various theories concerning its etiology. He said the arsenical theory was based on the similarity of symptoms, and on the finding of arsenic in the hair and toenails of some patients; but the herpes, the pigmentation and the painful feet of arsenical neuritis were not seen in beriberi. In addition to this the neuritis of beriberi was chiefly parenchymatous, while that of arsenic was chiefly interstitial. The rice theory had its main support in the almost complete immunity of Tamils from the disease in a country where beriberi was one of the three chief causes of death. These Tamils subjected their rice before husking to a preliminary boiling, while the other races husked their rice raw, and so it could become contaminated by the poison which was in the husk. This was not the only difference between the Chinese and the Tamils, for the former rarely took hot things with their rice, whereas the Tamils always took a quantity of pungent things

containing essential oils, which it would be reasonable to regard as preventives. The place theory supposed that the virus existed in certain places or gangs, some considering that the organism, others that only the toxin produced by the organism gained entrance to the system. Only conjectures could be made as to how the organism or toxin entered the system. The theory of Hamilton Wright was that beriberi was 'an acute infectious disease having a definite primary lesion' in the stomach and small intestine, and that the casual organisms might be ingested in any food and drink accidentally contaminated and might 'multiply and produce a toxin both in the contents and walls of the affected stomach and in the small intestine.' The chief support of this theory was the finding of gastroduodenitis in all cases in which death had occurred in the early stages of the disease. Bearing on the rice theory, Dr. Clarke related an experience of his own. He was in charge of a hospital and of an Asylum for Decrepit Vagrants in Lower Perak. The hospital had been in use for several years; the asylum, though an old building, had for some time been empty. The hospital and asylum were about three hundred yards apart; the soil, air and water supply were the same. The hospital had cement floors and very well ventilated wards; the asylum had raised wooden floors and very badly ventilated wards. There were about sixty Chinamen in the asylum, and about thirty in the hospital daily. The food in the two institutions was similar in quantity and quality, and was supplied by the same contractor. The conditions at the hospital were, on the whole, far better than they were at the asylum, except for the one fact that the clothing, bedding and utensils at the hospital had been in use for some time, whereas all these things at the asylum were absolutely new. Beriberi cases were admitted into both institutions, but of thirty cases in the hospital between the middle of November, 1903, and the end of the year, six originated in the hospital in men admitted for other diseases, and twenty-nine of the thirty patients died, showing an extraordinary virulence. During the same period at the asylum no beriberi paients died and no new cases occurred among the inmates. After very thorough disinfection of the hospital which included boiling all clothes, perchloriding the bed-boards, floors and walls, and changing the patients around so that the Tamils occupied the Chinese ward and the Chinese the Tamil ward, no more cases arose. No change was made in the diet. No Tamils acquired the disease, though their rice was the same and actually cooked in the same vessel with that for the Chinese. It might be noted, however, that they had hot curry-stuffs and no pork.

Dr. Clarke said it was quite the exception for dressers, or even for ward attendants, whro might sleep every night in beriberi wards, to acquire the disease. He had known a Chinaman who had been a ward attendant for nine years (and who must have slept many hundred times in a ward containing thirty or forty beriberi patients) leave in order to go tin mining, and come back into hospital in a few months with beriberi.

The late Dr. Louis Vintras contributed to *The Hospital,* November 26, a paper on beriberi which possesses particular value in view of the reported ravages of the malady in the Japanese army, which is in other respects so well guarded from the attacks of disease. Dr. Vintras had had a long experience in observing the disease while in Brazil and the Guianas, and his conclusions are therefore of interest. His belief was that the malady is neither endemic or epidemic, but is primarily due to privations and faulty nutrition, and that both white and coloured people are equally liable to it. He states, moreover, that as Professor Achermann, the president of the Norwegian Commission on the disease, has recently established, there is no essential difference between Asiatic beriberi and ship beriberi. The difference in the symptoms on which it has been sought to lay so much stress, is a difference due simply to the conditions under which the patients find themselves, and not to any fundamental pathological difference. For the symptoms differ as largely among Asiatics as they do among the members of white crews, nor can it be said that the form it assumes is more severe with the one class of patients than with the other.

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The writer pointed out an important pathological feature in connection with the disease, which is that when the damage done to the nerve endings has reached a certain point, though the progress of the disease may be arrested, the affected parts of the nerves do not recover and the paralysis and subsequent deformities are irremediable.

Dr. Vintras summed up as follows: 'Beriberi will appear wherever life is dependent for any length of time on foods, whether animal or vegetable, whose nutritive value has become impaired, more especially when people are at the same time subjected to heavy physical strain, or to long exposure in debilitating climates. Our presetn knowledge of dietetics is too imperfect for us to formulate the exact relations between the different constituents of our foods and the different tissues of the body. Otherwise, knowing that it is nerves which are primarily affected in beriberi, we should be able to say what is the particular impairment in food generally which is responsible for the causation of this disease.'

Leprosy.—Leprosy existed in Egypt in prehistoric times and extended to another land only when intercourse was established between the two countries. It reached Greece at about 345 B.C., Italy in the first century before Christ, and from the latter country extended to Germany, France and Spain. Crusaders returning from the Orient also brought back the disease in later times and eventually all Europe was infected. Leprosy is known to have existed in Great Britain in the tenth century, and from that country it was carried to Iceland and Greenland. From Germany it extended to the Scandinavian countries, and from the latter to Finland and Russia. It also reached Russia from the south and east, and in the south it was at one time called the Crimean disease. The West Indies and South America probably were infected from Spain, and through these channels the disease was carried to the southern states. The leprosy of the western states seems to have been imported by Norwegian immigrants chiefly. In 1902 the United States leprosy commission found 278 cases in that country. One hundred and eighty-six of these individuals probably contracted the disease in that country, 120 were born in foreign countries and 145 were native born. The disease also extended around the globe in the opposite direction, reaching China, Japan and the East Indian Islands from India. The Sandwich Islands became infected in the nineteenth century.

The contagiousness of the disease appears to have been recognized at a very early period. In 636 A.D., leprosy houses were instituted in Italy and other countries, and the practice of segregating lepers soon became general. The hospitals were called Lazarus houses in middle Europe and St. George houses in Scandinavian countries. Pipin and Charles the Great declared marriage between lepers illegal. The rapid disappearance of leprosy in middle Europe during the sixteenth century is ascribed largely to the segregation of the patients.

In 1872 Hansen announced that small rods, sometimes intracellular and sometimes free, were to be found constantly in teased preparations of leprous tissue. These rods, leprosy bacilli, are now universally recognized as the cause of the disease, and in 1879 they were stained by Neiser and a year later by Hansen. The organism is non-motile, has about the dimensions of the tubercle bacillus, the same staining reactions, and frequently shows a beaded appearance (degeneration forms (?)). It is said to take up dyes more readily than the tubercle bacillus, but the difference is not so great as to be distinctive. It stains by Gram's method.

Success in cultivating the bacillus has been reported a number of times, but the researches of others have failed to confirm these successes. Up to the present time it is probable that the organism has not been made to grow in artificial media. The resemblance of the bacillus to other acid-fast organisms, which are not pathogenic for animals, and the non-susceptibilty of experiment animals to leprosy. are conditions which render very difficult the identification of a culture as that of the leprosy bacillus. Nicolli is said to have produced leprous nodules in monkeys by inoculating them with diseased tissue.

So far as known the organism has no natural existence outside the human body, and it is disseminated only by the secretions of the diseased. It is discharged chiefly through the secretions of the nose and the upper respiratory passages, the surfaces of which are so commonly the seat of leprous ulcers, and also through ulcerating lesions of the skin. Expectorations, sneezing and coughing have approximately the same significance for the dissemination of leprosy bacilli as of tubercle bacilli. Infected droplets of sputum may be emitted by forcible speaking. It is stated that the organisms found in the sputum and nasal secretions appear to be largely degenerated, a condition which may lessen the infectiousness of these substances.

The infectiousness of the leprosy bacillus is of a low character. 'Epidemiologic experience teaches that infection occurs only through intimate and prolonged association with the diseased, in which doubtless uncleanliness plays a very important rôle' (Gotschlich). A leprous husband eventually infects his wife, and the children of lepers commonly develop the disease early in life. The high percentage of leprosy which is noted among the laundresses of infected localities indicates that the disease may also be transmitted by indirect contact. Gotschlich throws some doubt on the importance of dust infection since so many of the bacilli found in sputum appear to be degenerated. Nothing is known of the resistance and viability of the organism outside the body.

On account of the early appearance and almost constant occurrence of leprous lesions in the nasal passages Stricker believes that the latter constitute the chief infection atrium; of this Hansen is not positive. Nasal ulcers may be present in latent or apparently healed cases. Kolle cites a case showing extensive involvement of the spleen and liver in which the intestinal tract was considered the infection atrium. In some instances in which disease is first noted in the feet, the organisms are supposed to gain entrance with infected soil through abrasions in the skin. According to Cornil and Babès, infection may take place through the hair follicles and sebaceous glands. The theory of Jonathan Hutchinson that leprosy may be contracted through eating diseased fish, or that the latter in some way may render the individuals susceptible to infection is not generally accepted. Hereditary acquisition of the disease is of doubtful occurrence, although the bacilli have been found in ova (Babès) and commonly are present in enormous numbers in the testicles. Hansen states, however, that he has never found them in the female generative organs.—*The Journal.*

Because of the failure to cultivate the leprosy bacillus, experimental work with the serum and cells of men and animals, by which the conclusions as to the defensive powers of the body might be drawn, cannot be carried out.

The principles of prophylaxis may be illustrated by citing the practices in Norway. Originally all lepers were confined to institutions. At the present time, however, only indigent lepers and those who can not be suitably cared for at home are required to enter an asylum, where they live under the best hygienic conditions. Other patients are allowed to remain at home, with the understanding that they sleep alone and, if possible, have separate rooms, that their clothing, linen and eating utensils be used by on one else ,and that proper precautions be taken in the washing of linen. Dressings and bandages must be burned. Leprous mothers not to nurse their offspring; kissing to be prohibited; under no circumstances should a leper touch food to be eaten by others. Under these regulations the number of lepers in Norway has decreased from 2,870 in 1856 to 577 in 1900.

In the May number of the St. Thomas *Hospital Gazette,* Dr. G. Armauer Hansen gives an interesting account of leprosy in Norway. It is not known when the disease was introduced into that country. Dr. Hansen thinks it probable that some of the Vikings caught the disease on their cruises to the north of France, England or Scotland. Nothing positive is known about leprosy in Norway before 1277, when King Haakin V. by his will decreed that the St. Catharina Hospital in Bergen should only admit lepers. Later there was a hospital in Tinsberg and one at Hamar, and that, says Dr. Hansen, is all that is known about the disease in Norway till 1840,

when Danielssen and Boeck began their memorable researches. Then it was that, in the words of Virchow, leprosy entered into the number of scientifically studied diseases. By the census of the lepers in Norway, made in 1845, they found that the total number was 1,122, and their investigations led them to the conclusion that leprosy was essentially a hereditary disease, but that it might also arise spontaneously as the result of bad living and a wet climate. In accordance with the pathological concepts of the day, they thought the disease was caused by a dyscrasia—too much albumen in the blood. At their suggestion refuges in which poor lepers could be cared for and treated were established at Bergen, at Molde and at Trondjem; 'thereby,' says our author, 'were taken the measures which have proved so successful.' Hansen began his studies on leprosy in 1868 under the guidance of Danielssen. In 1871 and 1872 he made researches on the etiology of the disease in rural districts, and in this way he found that many facts as to the spread of the disease could be much better explained by contagion than by hereditary. He was thus led to search for a parasitic agent, with the result that he made his famous discovery. At the same time he revised the statistics of the prevalence of the disease. He found that, whereas the number of lepers in 1856 had been thought to be 2,079, there really were 2,833. Careful inquiries satisfied him that no decrease in the number of lepers had taken place till that time. Since then the records have been accurately kept, and they show that the disease has steadily diminished, a result which in Hansen's opinion can be explained only by the system of isolation, partial as it was, which was adopted. 'It would,' he says, 'be highly remarkable that the improvements in the preparation of fish food should set in exactly at the same time as the isolation of lepers set in.' But it is known with certainty that no such improvement in the way of dealing with fish took place at that time. When Hansen made his researches in the country districts in 1871 and 1872 he found that the peasants still consumed badly cured fish in large quantities while leprosy was already decreasing. He sums up—and he gives his conclusion the emphasis of italics—that *the fish diet theory of leprosy does not hold good for Norway, and probably not for any other locality.* While the fish theory cannot explain the decrease of leprosy in Norway, he is inclined to consider that decrease the best argument so far available in proof of the contagiousness of the disease.

If there be still any who do not admit the contagiousness of leprosy, the case brought forward by Professor Wolff of Strassburg at the International Congress of Dermatology, held last year at Berlin, should prove convincing. The facts are as follows: On November 2, 1903, a man suffering from undoubted leprosy attended Dr. Wolff's skin clinic. After spending five years in Tonquin he had returned to his native place, Urbach. At the end of two months he was admitted to the hospital there. Thence he had been sent on to Strassburg for treatment. In the latter city he remained in hospital till his death, which occurred on July 4, 1904. On February 2, 1902, a nephew of the foregoing presented himself at the clinic. He was a robust young fellow of 19, and had always been quite healthy until recently, when he complained of sharp pains in the back. He had never resided out of Urbach. During the two months' sojourn of the leprous uncle in the house of the young man's parents in that place the lad had often played with him and kissed him. On investigation the lad was found to be suffering from leprosy. This instance of the disease occurring in a leprosy-free area is on a par with the well known Irish case recorded by Dr. Benson.

The subject of leprosy has attracted attention in the United States this year.

On Monday, May 15, there was a conference of representatives of State Boards of Health with the Surgeon-General of the Public Health and Marine Hospital Service, Dr. Wyman. Twenty-seven states were represented.

The first subject discussed was the control of leprosy.

It seems to be the general opinion that the danger from leprosy in that country is increasing. Dr. Geddings, of the Marine Hospital Service, read a report showing

that there are 278 lepers known of in the United States at the present time; 176 males and 102 females. One hundred and forty-five are American born and 129 foreign born. One hundred and eighty-six apparently contracted the disease in that country and 68 abroad. But 72 of the cases are isolated, the others being at large.

The establishment of a National Lepers' Home, for the segregation of all lepers was advocated. Dr. Wyman stated that a bill had been presented to the last Congress for such a home, and another one providing for the study of leprosy in the Island of Molokai, Hawaii, under the supervision of the Public Health Service of the United States.

A bill recently passed by Congress provides that when the Territory of Hawaii shall have ceded to the United States in perpetuity a tract of land one mile square within the leper settlement on the Island of Molokai, a hospital station and laboratory of the United States Public Health and Marine Hospital Service shall be established thereon for the study of the methods of transmission, cause and treatment of leprosy. It further authorizes the Secretary of the Treasury to cause the erection on a site selected of suitable and necessary buildings, and that the surgeon general of the Public Health and Marine Hospital Service, through his accredited agent, may receive patients afflicted with leprosy and committed to his care under the legal authorization of the Territory of Hawaii. These patients are not to exceed forty in number to be under treatment at any one time, and they shall remain under the jurisdiction of the surgeon-general until returned to the proper health authorities of Hawaii.

The surgeon general, with the approval of the Secretary of the Treasury, is authorized also to detail, or to appoint, for the purposes of these investigations, any medical officers, acting assistant surgeons and others who may be necessary for the purpose. The sum of $100,000 is appropriated for the erection of the buildings, and $50,000 for the maintenance and pay of officers and employees for the fiscal year ending June 30, 1906.

At the Tracadie Leper Lazaretto continued good results follow the treatment spoken of in my last annual report. All the patients who take this treatment—chaulmoogra oil and strychine, with creolin outwardly—are improving under it both in health and spirits. The appalling darkness of their former hopeless condition being now lightened and brightened by gleams of hope. One patient, a man of 40, is so apparently cured of all symptoms of the disease that I felt justified at my last inspection of the lazaretto in approving of his going home, on the condition of his reporting himself from time to time for examination by the physician of the institution. He has been in the lazaretto for five years.

Previous to his being thus released all the ulcerations on his body and limbs had completely healed, and repeated microscopic examinations of the mucus from his mouth, throat and nostrils had for some time failed to reveal the presence of the leprosy bacillus.

Whether this apparent cure will prove permanent or not the future, of course, alone can show.

With regard to this question of cures it is well known that spontaneous cures do take place sometimes in leprosy, or rather spontaneous cessations of the disease.

Thus in the history of this lazaretto Dr. Smith reports the following cases: Judith Benoit entered in 1879, discharged in 1889. Augustin Losier, entered in 1879, discharged 1885. Louis Manzeroll, entered in 1882, discharged in 1890. Maurice Benoit (the man spoken of in my last annual report) entered in 1878, discharged in 1889.

Thus the cure in the case of the man discharged this year may also be spontaneous and not due to the chaulmoogra oil. But there can be no question of the benefits of this treatment in any case.

With regard to the theory of a fish diet as a cause of this disease, as held by Jonathan Hutchinson, the experience of our lazaretto is against it. And it may be of

interest to note that all the four discharged patients here mentioned by name are stated to have returned to an almost exclusively fish diet, and all remain free from any return of the disease. It is of course possible, however, that the very fact of their spontaneous cure may imply such an amount of self-immunization as may protect them from further attack.

Tuberculosis.—The chief event during the year in connection with this disease has been the holding of the International Tuberculosis Congress in Paris this month. And the chief event of that congress has been the announcement of Professor Emil Behring that he has succeeded in rendering animals immune, and can probably cure them when the disease has been fully developed. No experiments have yet been made by him on man.

At the closing session of the congress von Behring announced that in the course of the last two years he had established the existence of a curative principle entirely different from the antitoxic principle. It is the essential element, he stated, in the immunizing action of the vaccine with which he has been successfully combating bovine tuberculosis. Four years of experience have demonstrated the efficacy of the bovo-vaccine, and it is being applied now on a large scale in agricultural circles. 'The curative principle,' he continued, depends on the impregnation of the living cells of the organism with a substance derived from the virus of tuberculosis, which I call TC. When the TC has become an integral part of the cells of the organism of the animals treated with it, and has become transformed by these cells, I designate it as TX. In the bacillus of tuberculosis the TX, or rather the TC, pre-exist as an agent endowed with a large number of extraordinary properties. In the bacillus this agent has the function of a formative substance. It has also fermentative and catalytic properties. It can fasten itself by contact on other substances—a phenomenon called 'adsorption'—and has assimilating properties, in short, it represents the 'quasi vital principle' of the bacilli. In cattle, in the process of rendering them immune to tuberculosis, the TC is freed from accidental substances. It exerts a symbiotic action inside the cells of the organism, especially in the cellular elements which are derived from the germinal centres of the lympathic tissue. The presence of the TC is the cause of the supersensitiveness to Koch's tuberculin, on the one hand, and of the protecting reaction against tuberculosis on the other hand. This conception of a cellular immunity is entirely different from the antitoxic humoral immunity.' The *Journal* of October 17, 1903, page 994, presented Behring's announcement in regard to vaccination of cattle against tuberculosis. (See also page 620 of volume xlii.) His experience has convinced him that the technic was inapplicable to man, it being unwise to inject live tubercle bacilli into human beings for therapeutic purposes. He continued, in his congress address: 'The discovery of this curative principle is destined, I believe, to protect human beings threatened with phthisis against the injurious action of tuberculous infection. As I studied it more and more I found that the relations between vaccination and immunity became plain, and that it solved one after another of the puzzling problems in regard to the nature and mode of action of anti-diphtheria serum. After the discovery of the curative principle my efforts were directed to produce it *in vitro* and thus spare the cells of the organism the arduous and sometimes dangerous task of elaborating the TX under the influence of the TC. This I have accomplished, substituting passive immunization for the active immunization of my bovo-vaccine. The TC has to be freed from the substances which interfere with its therapeutic action. There are three groups of such substances in the body of the bacillus. The first is a substance which has a fermentative and catalytic action and is soluble in water. The toxic elements in Koch's tuberculin are derived from this substance. It posseses all the physical, chemical and tinctorial properties of volutin, and I call it TV. A single gram of this substance in the dry form is more powerful than a liter of Koch's tuberculin. The second substance is soluble only in a neutral salt, such as a 10 per cent saline solution. I call this substance TGL, as it is like globulin.

The third group includes various non-toxic substances, soluble only in ether, alchohol, chloroform, &c. After the bacillus has been freed from these three groups of substances it still retains its shape and staining properties, but it can be modified into an amorphous substance which is absorbed by the lympathic cells. The amorphous substance is elaborated and metamorphosed by these cells and they become oxyphile and eosinophile. Parallel with this transformation of the cells under the influence of the amorphous substance, the TC, the organism acquires the condition of immunity. One of the fundamental facts is that while the TC is not capable of reproduction, it yet has the power of inducing the formation of the tubercle. The tubercle thus created never undergoes caseation and never softens. It corresponds exactly to 'Laennec's tuberculous granulation.' In certain conditions the TC may also induce gray or gelatiniform infiltration.' In conclusion, Behring recalled that four years elapsed after his communication in regard to anti-diphtheria serum before the profession at large accepted it. Its acceptance was hastened by Roux's cordial backing, and he hopes that he may be fortunate enough to obtain such a friend for this new remedy, with as much conquering force and the same disinterestedness above all suspicion.

A despatch from Saranac Lake to the New York *Herald* says:

It has been known here for some time that Professor Behring has been working for several years on a consumption cure, and it is believed that his announcement promised to the International Congress on Tuberculosis to-morrow, will be that the 'cure' lies in feeding patients on the milk of immunized cows.

Dr. M. P. Ravenel, of Philadelphia, who visited Professor Behring a year ago and was shown around his farm, is on a visit to this place. Dr. Ravenel is assistant medical director of the Henry Phipps Institute for the Study and Prevention of Tuberculosis, in Philadelphia, and a director in the National Association for the Study and Prevention of Tuberculosis. He was appointed to represent the United States at the International Congress, at which Professor Behring promises to make known his discoveries, but was prevented from going abroad. He said to a reporter for the *Herald* to-night:—

'I do not know positively what Professor Behring's discovery is, but I know along what lines he was working when I visited him last year. Cattle were being vaccinated by an injection into their veins of living tubercle bacilli attenuated by long growth in an artificial culture medium. The idea was that immune bodies pass into the milk of the immunized animals, and the milk from the immunized cows was to be used for consumptive patients.'

Professor Maragliano had previously shown that without doubt the milk of immunized cows does contain immune bodies. In fact Maragliano's method is being tested at the Henry Phipps Institute in Philadelphia. When I visited Professor Behring I found him being assisted in his experiments by Dr. Roemer. I was given some of the milk from the vaccinated cattle and asked if I could detect any preservative in it. I thought that I could, but others said they could not. Professor Behring was using a new preservative called sofon.'

Dr. Ravenel said he wished it distinctly understood that he did not know positively what Professor Behring's cure consisted of, but merely knew along what lines he had been working. Possibly he has made some unannounced discovery within a short time. It is understood here unofficially that Professor Behring contemplated forming a company that would, as a business enterprise, erect a large sanitarium where the patients would be treated with the milk from immunized cows. It is also understood in some quarters that he expended considerable of the fortune he made with his diphtheria serum in searching for a consumption cure.

He was not the discoverer of the diphtheria bacillus. The bacillus was discovered by Dr. Klebs, father of Dr. Arnold C. Klebs, of Chicago, and Dr. Loeffler, but Professor Behring discovered the cure.

Physicians here are not ready to admit that his cure for tuberculosis will prove

a cure in reality. So many remedies have been announced as sure cures and later on have been proven as useless that the physicians here are sceptical. On the question of his right to retain the profits of his discovery there is some division of sentiment. In Germany such a proceeding is thought to be proper, but there is a different feeling here. However, those physicians who think he used the fortune made with his diphtheria serum to find a cure for tuberculosis are inclined to deal leniently with him.'

London medical weeklies do not take kindly to the pronouncement made by Dr. Behring at the recent Tuberculosis Congress in Paris in reference to the discovery of a cure for consumption.

An article in the *British Medical Journal* just out, declares: 'It may be pointed out that as far as the material which Dr. Behring has laid before us is concerned, there is no reasonable justification to anticipate any important progress in the treatment of tuberculosis. Dr. Behring failed to convince the majority of scientists in Europe that he had done a great work when he delivered his address in Cassel, and it is not too much to say that if it were not for his name having become great in connection with the diphtheria antitoxin, this work would not have aroused much notice.'

'It has not been accepted, and therefore one fails to see how this new research which is to a certain extent built up on immunizing experiments, can be ever provisionally accepted. Going a little further into the inquiry, we are given to understand that active immunization, which he believed he had previously produced, could be substituted by a passive immunization, and by means of these anti-bodies a curative process could be achieved. This of course, applies to laboratory animals, such as guinea pigs and rabbits, so that even if Dr. Behring can show later, and others can confirm his work, that true passive immunity can be produced on these animals, it does not by any means follow that the same applies to man.'

The *Lancet* says: 'Dr. Behring is a pathologist of world-wide reputation, with a splendid record of past achievements, and we may hope that his confidence in his own work will again be justified. None the less, we cannot but deprecate the great publicity which has been given to the investigation which at the present time is very far from complete.

'It appears to us that such congresses as that at which the announcement has been made have a designedly public character. Their role is to give opportunities for bringing forward a finished work in relation to the treatment and prevention of tuberculosis, among other diseases, and to educate public opinion in regard to these matters.

'Such assemblies are certainly not intended for the presentation of an incomplete work or the utterance of heterodox views as to the pathology of the disease.

'To bring forward such an investigation and to allow it to be published in lay journals, with all its complex technicalities, is to invite misrepresentation, and Dr. Behring has only himself to thank if he is made to say things which he never intended.

'Another painful aspect of the publicity which has been given to his statement is that it is calculated to raise hopes which, even at best, can only be realized in the distant future.'

At the last session of the Dominion Parliament a resolution was moved in both houses to the effect: That in the opinion of this House the time has arrived when parliament should take some active steps to lessen the widespread suffering and the great mortality among the people of Canada, caused by the various forms of tuberculosis.

As a result a joint committee of both houses was formed which presented the following report:—

The Joint Committee of the Senate and House of Commons appointed for the purpose of considering what further steps should be taken and what suggestions can

be made in the direction of the suppression of tuberculosis in Canada, with power to send for persons, papers, and records and to report, have the honour to report as follows:—

1. The Canadian Association for the Prevention of Consumption and other forms of tuberculosis, and various organizations of the same character in Canada, and prominent medical men were invited to make such suggestions as they might deem advisable on the question which was the subject of reference to this committee, and valuable suggestions and a large amount of information have been received, and have been made use of by your committee.

2. Until quite recently tuberculosis was regarded as generally hereditary and incurable, but modern discoveries have established that it is a communicable disease, and to a large extent curable as well as preventable.

3. There is in Canada a permanent corps of consumptive invalids, numbering at least forty thousand persons, of whom eight thousand die annually. In the provinces of Ontario and Quebec it is an ascertained fact that the deaths from tuberculosis alone are more than twenty-five per cent greater than from diphtheria, scarlet fever, typhoid fever, measles and whooping cough combined. Apart from the humanitarian considerations involved in the question, the financial loss alone entailed upon Canada by such an annual mortality is enormous, estimated by competent authorities at over $8,000,000 a year, which makes it imperative for the state to adopt the best possible measures of prevention and cure.

4. The problem of tuberculosis involves a social movement which does not affect one province, but all provinces; one district, but all districts; one class, but all classes in the community, in country as well as in town. It is a movement of so wide a character that, for it to have adequate practical results, the co-operation of the central government is absolutely essential.

5. The principle involving the interference of the Dominion government for the suppression of diseases of this kind was recognized immediately after confederation, and is embodied in the statutes of 1868, 31 Victoria, chapter 63, from which the following is extracted :

(7) Whenever Canada, or any part thereof, appears to be threatened with any epidemic, endemic, contagious or infectious disease, the Governor may, by proclamation, make such regulations as he thinks proper and necessary to prevent the introduction of such disease from beyond the limits, or to prevent its spread within the limits of Canada, and otherwise protect the public health, and he may, from time to time, revoke or amend the same, or make others in their stead in like manner, or may impose penalties, forfeitures and punishments for the breach thereof, and such regulations shall be published at least twice in the *Canada Gazette,* and the production of copies of the *Gazette* containing such proclamation, shall be evidence of the making, date and contents of such regulations.

(9) By such regulations the Governor in Council may appoint for any specified time, one or several 'Central Boards of Health' and may name the members thereof, and also such medical and other officers and servants as he may deem necessary to assist such boards, and the powers and duties of the said boards shall be such as are affixed to them by such regulations, and may be exercised by any number of the members thereof mentioned in the said regulations as constituting the quorum thereof; and the powers and duties of such boards shall cease on the revocation or at the time of the expiration of the regulations aforesaid.

(10) When(and so long as such regulations are in force, it shall be the duty of every municipal corporation or county sessions within Canada to organize a local board of health for the limits of their respective jurisdictions, and such local boards or any three members thereof, shall have power to act under the regulations aforesaid, and the direction of any central board of health, designated in such regulations, and the duties of such local boards of health shall be to enforce generally all sanitary measures required, and to carry out the regulations of the Governor in Council, and such orders

as may be issued by the central boards in pursuance of the provisions of such regulations.

(11) In the case of municipal corporations or county sessions neglecting or refusing to appoint a local board of health as aforesaid, or in the absence of any such authority in any locality, the Governor in Council may nominate persons within the limits of such municipal corporation, county or locality, to constitute such local boards of health.

6. The problem of preventing and curing the disease is exceedingly complex and necessarily entails a very large expenditure. The work may be taken hold of by the Dominion government or by the provincial and municipal authorities with the aid of the Dominion government.

7. In the opinion of your committee the federal government should be prepared to contribute yearly to each province a considerable share of the annual cost of dispensaries, inspection, the erection and maintenance of sanatoria and whatever other agencies may be found necessary to secure the desired end; the province, municipalities, individuals and benevolent associations contributing the balance; the federal government to prescribe the condition upon which the several institutions shall be entitled to their share of the subsidy, and also to have the right of inspection of each institution and of its books at any time, and also power to withhold its contribution in respect of any institution not fulfilling its requirements.

8. Your committee further suggest that unless the Dominion government feels prepared to take hold of the matter itself, a conference should be held at as early a date as possible between the federal and provincial authorities, for the purpose of determining the best action which should be taken in the premises.

9. Your committee suggest that the recommendations embodied in the present report be presented to the government by a joint delegation of both houses; and that their attention be again called to the resolutions passed unanimously by the Senate and by the House of Commons respectively, of which copies are hereunto annexed.

All of which is respectfully submitted.

Much educational work has been done throughout the year in connection with tuberculosis. Sanatoria have done their part, but many many more have been reached and benefited by dispensaries and by day-camps. The day-camp is very largely used in Germany and also in other countries. I visited one at Boston, Mass., with great interest. A small administration building, tents for dining, &c., and a number of easy deck chairs or couches on a sunny knoll with shade trees nearby, made up practically the whole necessary outfit. Here tuberculosis patients were brought in the morning, were kept in the open air all day, well fed at appropriate intervals, taught the use of the paper handkerchief or spit cup, and quietly instructed in rudimentary hygiene as applied to their case by the attending trained nurse and visiting physicians, so as for one thing to thus minimize the objections to their unavoidable return to their homes for the night. In this way between 30 and 40 were being daily benefited at an expense, I was told, not greater than that of the average cost of one bed in a sanatorium.

Anti-typhoid inoculation.—The German commission appointed to consider the use of anti-typhoid inoculation in the army, have presented an important report. They agree with the conclusion come to by British committees of inquiry, that it is impossible to doubt that inoculation can confer a certain measure of protection, but that it is urgently desirable to seek further information based so far as possible upon absolutely trustworthy data, with regard to the degree and duration of the protection conferred.

Japan's best victory.—Japan's work in war sanitation has been unprecedented. Before the Association of Military Surgeons, held at Detroit on the 28th of last month, Major Seaman delivered an address in part as follows:—

'The success of Japan in the recent conflict with Russia was due preëminently to three fundamental causes: First, thorough preparation and organization for war; second, to the simple, non-irritating and easily digested ration of the Japanese troops, and third, to the brilliant part played by the members of the medical profession in the application of practical sanitation, the stamping out of preventable diseases in the army—thereby saving its units for the smashing of the enemy in the field. It must never be forgotten that in every great campaign an army faces two enemies: First, the armed forces of the opposing foe; second, the far greater silent foe, disease. Of these enemies, the history of warfare for centuries has proved that the first kills twenty per cent of the total mortality in the conflict, whilst disease kills eighty per cent.' Major Seaman cited tables of statistics of battle records for two hundred years, showing that there has rarely been a war in which at least four men have not perished of disease, for one from bullets. He continued: 'But the crowning piece of imbecility was reserved for our late war with Spain, where more than ten were needlessly sacrificed to ignorance and incompetence for every one who died on the firing line or from bullets. This, too, in the short campaign of six weeks.'

'All of these statistics were studied with the minutest care and detail by the Japanese. Their authorities recognized that, in order to be victorious over a foe like Russia, this great silent enemy that slaughters 80 out of every 100 that fall, must be overcome. And the medical men of the army did it.' The speaker then showed the actual figures of the killed, wounded and sick in the Japanese army, from February, 1904, to the end of April 1905, which averaged nearly five deaths from bullets for one of disease, or 900 per cent better than the average in history. Major Seaman said: 'This record is unparalled and unapproached, and the medical men of the army achieved it.'

This marvellous result was attained, Major Seaman said by the work of ten years, beginning immediately after the war with China, when Japanese statesmen realized Japan would again have to go to war to preserve her independence as a nation. The great amount of illness likely to appear in the army was taken into consideration and the steps for elimination were taken.

Every hospital throughout Japan, and every base and field hospital in Manchuria has its bacteriological laboratory.

'Too much cannot be said in enthusiastic commendation of this side of the service. No man suffers from temperature but whose blood goes under the microscope. Malaria, is malaria, and typhoid is typhoid in the Japanese army. Diseases are but guessed at, as they were in Cuba, the Philippines and South Africa, where often for a full week the physicians attempted to diagnose cases by sleight of hand and trick of eye. The limits of this paper do not admit of more than the merest reference to the splendid system of sanitation followed in the field. Suffice to say that during the campaign extending over a year and a half, with from 300,000 to 600,000 soldiers undergoing the severest hardships and privations of active service, there are in the Japanese army thirty-six men out of every one hundred who have never reported at sick call; thirty-six men who never saw the inside of a hospital or were sick in quarters, a record absolutely unparalleled. The war has taught many lessons and destroyed many ideals in matters military, as in matters surgical. In surgical technique the Japanese have taught the foreigner comparatively little, but in the field of sanitary science and dietetics they have demonstrated, what has never been done before, that "preventable" diseases are actually preventable. They have preserved their armies for the legitimate purposes for which armies are enlisted; the killing and conquering of the enemy in the field, instead of having four-fifths of its mortality victims to the silent foe.

It is against this dreadful scourge, this needless sacrifice, that the Japanese have made their hardest fight and won their most signal victories—victories that will redound more to their credit than even the expulsion of the Muscovite aggressor.

'A despatch received in London on September 21 from the Tokio correspondent of the London *Standard,* giving the statistics of the war to that date, reports: "Killed, 46,180; died of wounds, 10,970; died from sickness, 15,300." This percentage of death by sickness was barely one-fourth of the total dead, which is a record not paralleled in the annals of war.

Surgeon-General Suzuki, of the Japanese Navy, on the same occasion told of two customs that were introduced into the Japanese navy during the recent war, which were of extreme interest and likely to be far-reaching in their influence, because they are simple and, as a rule, possible. It is no wonder that a distinguished medical authority in the United States navy is reported to have said in comment that the Japanese surgeon-general had made perhaps the most valuable contribution of modern times to naval surgery. The suggestions that were carried into effect under his directions, however, are so obvious that it is rather difficult to understand how they did not occur to martial surgeons before this. Although the suddenness of the attack would often prevent their use in land engagements, naval combatants usually have sufficient warning of a battle to allow at least a brief preparation. Dr. Suzuki considers that much of the Japanese success in the treatment of wounds must be ascribed to the order issued before each engagement, that each member of the crew should take a bath and put on perfectly clean underclothing.

His idea is that gunshot wounds are likely to be contaminated by portions of clothing carried into the wounds. The bullet itself may be considered perfectly sterile because of the high temperature to which it has been exposed, and which has continued during its course through the air, thus making it practically impossible for it to collect any virulent germs from the atmosphere. If then the clothing be reasonably sterile, the hope of a sterile wound resulting is greatly increased. As a matter of fact, very few of the sailors and marines wounded during the Japanese naval battles and sieges suffered from septic complications. Very severe wounds, even those which penetrated joints, healed as kindly, as a rule, as those which might be made by the surgeon's knife, under careful asepsis in an operating room.

This, however, is not the only improvement worthy of note in the medical care of their sailors and marines that the Japanese surgeon-general has introduced. The vision of the men who fire the guns of the warship must necessarily be of the very best if their shots are to count. Before every engagement the surgeons examined the eyes of the gunners. Any of them found with slight impairment of vision were treated, and if the impairment was too grave to yield to immediate treatment they were transferred to another station and their places filled by men whose eyes were perfect. And, too, during engagements, every battery crew was supplied with water in which a one per cent solution of boracic acid had been mixed to wash out their eyes when they become affected by powder smoke or dust.

Formaldehyde disinfection.—Dr. A. G. Young, secretary of the State Board of Health of Maine, having noticed that, by mixing potassium permanganate and formalin, formaldehyde gas was liberated, requested Dr. H. D. Evans, the chemist of the board to ascertain if that chemical reaction could be turned to practical account for disinfection purposes.

After a long series of experiments Dr. Evans has suggested the following method, which is very simple: It consists in placing finely powdered permanganate in a large earthen jar or basin and then in pouring formalin over it, the operator escaping from the room as quickly as he can. Six and a half ounces of permanganate of potash are to be used for every pint of formalin employed. A violent reaction immediately follows the poring of the formalin, and formaldehyde gas is liberated in great quantities. After five minutes, over 81 per cent of the gas is liberated and spread all over the room with great force. This first reaction having taken place, sufficient gas is liberated during the following hours to compensate the leakage from the rooms. After three hours, the microbicide action of this disinfectant is as much done as after 16 hours.

The advantages of this method are obvious. As the author says: 'The chemical reaction furnishes all the heat necessary to vaporize the formalin, doing away with all need of fire. The ordinary house can furnish all material necessary for a generator, while the re-agents can be cheaply purchased at any drug store. The method of operation is so simple that any one can attend to it who can tell the difference between a solid and a liquid, requiring only the the pouring of the measured amount of formalin upon the corresponding quantity of permanganate. Absolutely no care is required after mixing the re-agents, the reaction starting and dying out of itself.' The bacteriological results of the Young and Evans method were tested on a large scale by Dr. Russell, the bacteriologist of the board. In a number of rooms, the capacity of which varied from 525 to 1850 cubic feet, and under various climateric conditions, from January to May, 1904, 1529 cultures of microbes were exposed to disinfection, and all remained sterile but 27.

Wireless telegraphy.—Owing to the very frequent interruptions of the telegraph communication with the St. Lawrence quarantine it is proposed to install the Marconi wireless system in connection with this station. An item was voted for it by parliament at its last session. Almost every year the heavy running ice has crushed or broken the cable. This has meant late telegraphic communication each summer, and serious interference with the requirements of the incoming vessels in the spring, and of the service generally. The wireless system will, of course, obviate all this.

Congresses and meetings.—The Canadian Medical Association held its annual meeting at Halifax, N.S., in August last. Amongst other important matters a resolution was passed again urging the creation of a Dominion Department of Public Health under one of the existing ministers. This resolution I have quoted in an earlier part of this report.

The American Public Health Association has held two meetings since my last report, one in Havana, Cuba, in January last, and one in Boston, Mass., last month. Many interesting and valuable papers were presented and discussed. The next meeting is to be held in the city of Mexico.

Inspection duty.—On May 26 I left to inspect the Grosse Isle quarantine station. There were during my visit there nearly 300 second cabin passengers of the ss. *Kensington* in quarantine of observation for small-pox. On July 13, I had the honour by command, of accompanying His Excellency the Governor-General in his visit to the Grosse Isle station. Leaving Ottawa on August 3, I inspected the frontier inspection work at Owen Sound, Sault Ste. Marie, Bruce Mines, Thessalon and Fort Frances. On August 20 I left for Halifax, attended the meeting of the Canadian Medical Association in that city, and inspected at Halifax, Sydney, Louisbourg and Pictou, N.S., Charlottetown, P.E.I. St. John, Chatham, and the leper lazaretto at Tracadie, N.B. I attended as the representative of the Dominion the annual meeting of the American Public Health Association held in Boston, Mass, September 25-29. On the 10th of this month I left for the Pacific coast, inspected en route the frontier inspection work at North Portal, Sask., and subsequently at Vancouver, Victoria and William Head, B.C.

The quarantine stations, &c., Grosse Isle, Que.—At this station and at its substation of Rimouski, 380 vessels have been inspected during the quarantine year, 351 at Grosse Isle, and 29 at Rimouski; 98,141 persons were inspected.

Twenty-five vessels arrived with infectious disease.

The admissions to the hospital were 351. They included cases of small-pox, scarlet fever, measles, diphtheria, chicken pox and enteric fever.

The deaths in hospital were 4.

The much needed second steamer is now under construction.

The most pressing requirements of the station are the carrying out of the wharf into deep water, and the erection of an administration building at the western end, with in addition a few beds for non-infectious cases.

The question of the replacing of the old wooden detention sheds, which date from 1832 and 1848, by modern brick buildings, is becoming more and more deserving of your consideration, as each year passes by.

Halifax, N.S.—Vessels inspected, 255; persons inspected, 44,458.

Nine vessels arrived with infectious disease.

Four deaths occurred at the station of Lawlor's Island, two from marasmus and one from broncho-pneumonia after measles; and one from enteric fever.

An amount was voted at the last session for the erection of a winter hospital at this station.

A new steamer to replace the worn out *Argus,* and the electric lighting of the station are the two most urgent needs of this service.

St. John, N.B.—Vessels inspected, 179; persons inspected, 22,024.

Seven vessels arrived with infectious disease.

The admissions to hospital were 13. The diseases were scarlet fever, chicken pox, diphtheria and measles.

One death occurred from scarlet fever.

At the request of the Board of Health of St. John, Dr. March disinfected the outward going schooner *Winnie Lawry* from St. Martins, an outport of St. John, for New York. A seamen came by rail and joined the schooner at St. Martins, and then developed small-pox after they had cleared from there. There was no spread of the disease.

The two new detention buildings and the winter hospital are approaching completion.

The completion of the water supply is the most urgently pressing want at this station. A deep water wharf is greatly required, and larger disinfecting appliances.

Sydney, C.B.—Vessels inspected, 77. No quarantinable disease presented itself.

The extension to the wharf is nearing completion.

Artesian boring has been suggested to augment and improve the water supply at this station.

Louisbourg, C.B.—Vessels inspected, 22. No quarantinable disease occurred.

The requirements are as last year approximately the provision of similar accommodation to that at Sydney.

Chatham, N.B.—Vessels inspected, 64; no cases of quarantinable disease.

Charlottetown, P.E.I.—Vessels inspected, 9. No quarantinable disease occurred.

The greater part of the roadway to the station has now been sufficiently widened.

William Head, B.C.—Vessels inspected, 176. The number of Asiatic steerage passengers has fallen very much. The increased tax has checked Chinese immigration, and the war has limited that from Japan. There were 2,336 Chinese steerage passengers inspected and 5,378 Chinese members of crews; 2,484 Japanese steerage passengers, and in crews, 1,278. Other Asiatics, 221.

Five cases of measles and one of epidemic dysentery were admitted to hospital.

Various improvements and additions were made at this station this year. New bath rooms for first class passengers, houses for the electrician and for the guards. A site for the guard house and a right of way outside the boundary fence were acquired. This allows for the guards watching and patrolling outside the quarantine boundary at the neck of the promontary on which the station is placed.

Hence an unsuitable guard can be at once got rid of, as could not be done heretofore when the guards were in contact with suspects under quarantine of observation. And with the patrol outside the fence there is not the same opportunity to elude the guards or attempt bribery. Repairs were effected to the wharf. A new steamer is being built for this station. The present small steamer, the *Earl,* will be useful as a reserve and second steamer. By fitting her up with modern disinfecting appliances, the disinfection of vessels at the wharf could be carried out without the present encroaching upon the floor space of the wharf, and the *Earl* would moreover be available for disinfecting vessels in the offing, and sailing vessels in the Royal Roads.

The storage battery has been increased in its voltage; this battery is connected with the houses and with the range lights. By its use fuel is saved, and the running plant can be shut down earlier in the evenings, and save its starting up again in the winter mornings.

A new sulphur dioxide appliance and a second new steam disinfecting cylinder are most pressing requirements at this station.

Victoria, B.C.—Foreign coasting vessels touching at Victoria, 974. Required inspection, 2. No quarantinable disease occurred.

Vancouver, B.C.—One vessel inspected. There were no cases of infectious disease.

Temporary frontier and coast inspection.—In addition to these regular stations, you have this year given the country the additional protection of extra inspecting officers at the following points where, from time to time, peculiar threatenings of disease, or the reported lack of effective health organizations to the south of them, seemed to make the importation of small-pox most to be feared: in Nova Scotia, Canso; in Ontario, Owen Sound, Sault Ste. Marie, Bruce Mines, Thessalon and Fort Frances; in Saskatchewan, North Portal; in British Columbia, Gateway.

The North-west Territories.—Thirty-two cases of small-pox occurred during the year: 3 at Moosejaw, 1 east of Cardston, 1 at Medicine Hat, 24 at Didsbury, 1 at Wetaskawin and 2 at Olds.

All of these were newly arrived immigrants from the United States, except one a resident of Manitoba, who had been away on a visit.

Except for one case which occurred in September, and came under the supervision of the new province of Saskatchewan, the territories have been free from small-pox for the last five months.

Yukon Territory.—There have not been any cases of the major infectious diseases during the year.

Leper lazaretto, Tracadie, N.B.—There are now at this institution seventeen patients on the books, ten males and seven females. Those actually in the lazaretto are fifteen, eight males and seven females. In addition to the man mentioned in my last annual report as out on leave of absence, I was enabled at my last visit of inspecton to authorize the release of another man for the time being, at any rate who is apparently cured of the disease.

As referred to above under the heading of leprosy the use of chaulmoogra oil continues to give encouraging results.

There were no deaths during the year.

Two new patients, both from neighbouring districts, were admitted.

Public Works Health Act.—Your inspector reports that at all the many camps in the various public works throughout the Dominion, he has found the medical supervision, the hospital accommodation given, the medicines provided, and the sleeping

quarters for the men when housed, together or in tents, to be equal to—if not indeed an improvement upon—the very good conditions reported for the last two years.

I have the honour to be, sir

Your obedient servant,

F. MONTIZAMBERT, I.S.O., M.D.Ed., F.R.C.S.E., D.C.L.,
Director-General of Public Health.

The Honourable
The Minister of Agriculture,
Ottawa.

No. 2.

(G. E. Martineau, M.D.)

Grosse Isle, Quebec, October 31, 1905.

Sir,—I have the honour to submit this my annual report of the St. Lawrence Quarantine Service to October 31, 1905.

There were 359 vessels examined at this station during the year, being an increase of seven as compared with last year. The number of sailing vessels is decreasing each year. This year there were only twelve.

The total number of persons inspected was 98,141, being an increase of 28,030 as compared with last year.

They were divided among the different classes of passengers, as follows:—

First cabin	3,708
Second cabin	16,068
Steerage	49,811
Cattlemen	1,955
Crews	26,129
Stowaways	470

The number of stowaways while not quite as large as last year, still continues very great, and this year they included a number of foreigners who, with those from Great Britain, were very degenerate specimens of manhood, and the majority would have been deported had they been compelled to pass the inspection of the Immigration Department.

Infectious disease was reported or discovered on the following vessels at different times, named in the order of their first arrival at this station with sickness on board: ss. *Montford, Manxman, Tunisian, Ionian, Dominion, Torr Head, Montreal, Victorian, Lake Champlain, Sarmatian, Bavarian, Kensington, Lake Erie, Canada, Lake Michigan, Sardinian, Ottawa, Mongolian, Virginian, Buenos Ayres, Southwark, Lakonia, Mount Temple, Montezuma* and *Athenia.*

The diseases so reported or discovered were: smallpox, scarlet fever, measles, diphtheria, chickenpox and typhoid fever.

Small-pox.—SS. *Kensington*, Captain Marle, sailed from Liverpool May 4 with 294 second cabin and 806 steerage passengers, 1 cattleman, 1 stowaway and 179 screw, arrived at the station at 5 p.m., May 15, with one case of small-pox among the second cabin passengers.

That case was immediately removed to the small-pox hospital at quarantine.

All the second cabin passengers and 41 members of the crew that were considered as having been exposed to the disease, were landed for quarantine and observation.

Everybody on board having been vaccinated, and that part of the steamer occupied by the patient and the second cabin passengers having been thoroughly disinfected, the vessel was released and proceeded with the rest of the passengers and crew on May 18.

No other cases of small-pox having developed among those detained under observation, they were released and left the station on June 1.

The patient having fully recovered was discharged from the small-pox hospital at quarantine on June 13.

On one occasion only a passenger refused to submit to vaccination, although on numerous other occasions parties, who had refused vaccination by the ship's surgeon, allowed your quarantine officer to do it. Their objection was always the same, 'The manner and methods employed on board.'

The party who refused vaccination arrived here on the ss. *Kensington,* June 18. He was landed for the usual period of observation.

This year has been a very busy one at this station, especially at the hospital where there were 351 persons admitted.

There are actually 20 persons remaining at the hospital.

The number of deaths were four, two from scarlet fever, and two from broncho-pneumonia complication of measles.

Quarantine staff.—Dr. E. Belisle continued during the season the inspection of the weekly mail steamers at the Rimouski sub-station.

Improvements and requirements.—The works for the erection of the building which is to be used as quarters by the employees will be completed very soon, and I beg to hope that it will be ready to be occupied at the reopening of the station next spring.

Although certain amounts have been voted the last session for the wharfs and for the laundrying disinfecting apparatus at this station, these works have not been commenced yet, but I have reason to believe that they will be carried out early next spring.

I have to note with pleasure the fact that the contract to build a suitable steamer for this station has been awarded, and I beg to hope that she will be ready for the reopening of navigation next season.

The chief requirement now is a new building to be erected at the upper division, so as to have an office surgery, a place where to vaccinate passengers, and some rooms where to put passengers suffering from other diseases than contagious ones.

There are still some repairs, &c., absolutely necessary and in the interest of quarantine, the list of which is in the hands of our department.

All of which is respectfully submitted.

I have the honour to be, sir,

Your obedient servant,

G. E. MARTINEAU, M.D.,

Medical Superintendent, St. Lawrence Quarantine Service.

The Honourable

The Minister of Agriculture.

No. 3.

(N. E. Mackay, M.D., M.R.C.S.)

Halifax, N.S., October 31, 1905.

Sir,—I have the honour to submit my annual report for the year ended October 31, 1905.

The quarantine work of this station was uneventful during the year just closed, none of the graver forms of quarantinable disease entered our port and we had only a few cases of the minor diseases to deal with.

Minor diseases were found or occurred on board the following ships :—

SS. *Canada,* December 2, 1904, child convalescent from measles, March 11, 1905. 3 cases of measles, sent family of seven to Infectious Disease Hospital, city.

SS. *Corinthian,* December 11, 1904, child sick with measles ; sent to Infectious Disease Hospital, city.

SS. *Vancouver,* April 2, 3 cases of measles; sent to station.

SS. *Kensington,* April 10, child convelescent from measles.

SS. *Virginian,* April 14, 1 convalescent from measles; 1 convalescent from scarlet fever; wired Dr. March, St. John.

SS. *Carthaginian,* April 24, 1 case of measles. This case was not reported by either the captain or surgeon of the ship. Sent patient to the station where he died from broncho-pneumonia.

SS. *Pallanga,* April 29, 1 case of measles; June 20, 3 cases detained and sent to quarantine, supposed to be suffering from measles.

SS. *Laurentian,* May 6, 1 case of measles sent to the station for treatment.

Brigantine *Boston Marine,* September 26, 1 case of typhoid fever, sent to Infectious Disease Hospital where he died in three days. The patient was in a moribund state when the vessel arrived in port.

In every instance the hospitals and rooms occupied by the sick were disinfected with formalin.

The number of vessels inspected at this station during the year was 255, 22 more than in the preceding year.

The total number of persons examined was 44,458, being 2,257 less than in the past year. They were classified as follows: Cabin, 1,507; intermediate, 7,945; steerage, 25,284 ; crew, 9,348 ; cattlemen, 374.

There were 4 deaths at the station, viz.: 1 from broncho-pneumonia, secondary to measles, 1 from typhoid fever and two from marasmus. The latter were two of the three cases detained, supposed to be suffering from measles.

Masters of vessels reported six deaths on the voyages, form diseases other than quarantinable as follows : ss. *Tunisian,* 1 from apoplexy; ss. *Ionian,* 1 from cerebral hemorrhage; ss. *Sarmation,* 2 washed overboard; ss. *Pallanga,* 1 from fractured skull; ss. *Ulunda,* 1 washed overboard.

Twenty-six stowaways were reported by masters of incoming vessels, and three births.

Inspections are made as promptly as possible, but if we were provided with an inspecting station ashore, having telephonic comunication with Camperdown the service could be much better attended to and it would be more satisfactory to all concerned. The citadel signalling station cannot always be depended upon to report incoming vessels promptly.

We are trying to get rid of night work as much as possible, and with the aid of shipowners and agents we have been fairly successful.

This is the only port, I understand, on the Atlantic coast, at which night inspections are made to any extent in mid-winter. Night work in mid-winter—and we have to do the most of it in mid-winter because of the mail boats—is not by any means a pleasant job. We have sometimes to board ships in the stream at night when the vapour on the water is so dense from frost, that we cannot see fifty feet ahead of us. With such conditions existing we find it difficult to locate ships and dangerous to approach them and board them. In our sister city, St. John, I believe night work is not done. However, notwithstanding all this there would not be so much cause for complaint if our officers were given decent salaries for their services.

We need an inspecting station ashore badly and there is no better place for it in the city than the lumber yard, and now that the government is about taking over this garrison the department could do no better than to secure this place for an inspecting station. This place commands a good view of the entrance of the harbour east and west, and with a small outlay it could be made an ideal dock for our boat in all sorts of weather. As it is now we are tossed about from wharf to wharf with no place wherein to rest.

Our boat is not fit for the work of this station. She is old and out of date. Her boiler is always leaking and needing repairs or her engines are needing fixing. Those entrusted with her repairs either do not know how to do good work or do not want to make a good job for us. She is a bill of expense to us. We need a new and up-to-date boat provided with disinfecting apparatus, and for winter night-work she should have decent sleeping quarters for our men, and the crew should live and feed on board. As it is they have no fit place in our ship wherein to lay their heads at night.

For three months of the year we could not send patients to the station because of ice in the eastern passage. This fact alone proves that Lawlor's island is not a suitable place for a quarantine station, and that it should never have been chosen for such a purpose. The very time we need it most it is inaccessable. For the same reason it is not fit to be used for an inspecting station, and even although we were sure that the channel would always be clear of ice, there are other drawbacks to it being used in this connection. Distance and location are against it. Fog and thick weather, and a narrow channel in dark nights are barriers which cannot easily be overcome. The imperfect signalling of incoming vesels is another, though minor factor to be considered in this matter. Indeed no one familiar with the whole situation would for an instant entertain the idea of making Lawlor's island an inspecting station. With an eye into the future the question that should receive earnest attention is whether to continue it, even as a quarantine station.

The concrete tank is leaking through cracks in its walls. The leakage should be stopped. The water system, other than the tank, is in good working order. The buildings are in fairly good condition and well suited for summer work, but they are not well adapted for our severe winter weather. The bulk of our work is in winter.

We appreciate the action of parliament in voting money for an up-to-date hospital and for an electric lighting plant. We need both badly. The want of a good hospital and matron and keeper is a great drawback to the efficient care of the sick.

Custom house officers should not be allowed to leave vessels subject to quarantine inspection till they are granted free pratique. If this privilege is to be given to them I see no reason why it should not be extended to every citizen of Halifax. These officers can bring disease ashore as well as any other persons. Citizens often wonder why these men should be permitted to treat quarantine regulations with indifference. Such actions on the part of government officials, not having anything to do with quarantine, can only tend to bring the service into discredit. As might be expected these officers not content with going on board themselves often bring their friends

with them. The customs service will not suffer anything, if the quarantine law is enforced as it should be, against its officers.

I have the honour to be, sir,

Your obedient servant,

N. E. MACKAY, M.D., M.R.C.S.,
Quarantine Officer.

The Honourable,
The Minister of Agriculture,
Ottawa.

No. 4.

(J. F. March, M.D.)

St. John, N.B., October 31, 1905.

Sir,—I have the honour to submit my report for the year ended October 31, 1905.

During this period one hundred and seventy-nine vessels and twenty-two thousand and twenty-four persons were inspected at this station.

The latter are classified as follows:—

Cabin passengers	2,282
Steerage passengers	11,694
Cattlemen	659
Crew	7,247
Stowaways	142
	22,024

Of these I vaccinated two hundred and three on arrival.

Twelve deaths occurred en route on vessels inspected by me. The causes of death were in 4 cases pneumonia; in 2 cases marasmus; and in 6 cases diphtheria, septicaemia, acute meningitis, convulsions, inflammation of brain and nephritis one each.

Quarantinable diseases were found upon or reported by the steamships *Lake Michigan* (twice), *Lake Manitoba* (twice), *Lake Erie, Mount Temple* and *Montrose.*

Nine cases were removed to the quarantine hospital, and seventeen to quarantine of observation.

Four cases were transferred from quarantine of observation to the hospital, bringing the total admission to hospital up to thirteen.

The causes of admission to hospital were in one case scarlatina, in two cases chicken-pox, in two cases pneumonia, in two cases diphtheria, and in six cases measles.

Twelve of the thirteen cases recovered and were discharged. The case of scarlatina developed septic meningitis and died. The body was buried at the station.

None of the graver quarantinable diseases came under my observation during the year.

At the request of the Board of Health of St. John and with your permission, I disinfected the schooner *Winnie Lawry,* on which a case of small-pox had been discovered while this vessel was in Saint Martins, an outport of St. John. The patient, who was removed to the St. John epidemic hospital, had come by rail from one of the northern counties of this province, and had developed small-pox soon after joining his vessel. The vessel having cleared before the character of the disease was known, sailed for New York without having been disinfected, and came into this port, without reporting, for the purpose of securing a cook. Having no authority over her, I immediately reported her presence to the St. John Board of Health. This body promptly quarantined her and while in their custody I disinfected her. There was no spread of the disease.

While on the subject of small-pox, I desire to direct your attention to the unsatisfactory method employed in regard to vaccination by transatlantic steamship companies carrying steerage passengers. Our regulations practically require that all steerage passengers shall be immune to small-pox. A successful vaccination means immunity. In spite of this it is the custom of the steamship companies and their responsible officers to put off the necessary vaccination of their steerage passengers until within one or two days of their arrival here. Then it is rushed through and cards are given to all showing that they are 'vaccinated' or 'protected.' It is impossible for a quarantine officer to determine whether a one or two days' old vaccination is, or may become, a sufficient protection against small-pox, and hence this practice of postponing the vaccination of steerage passengers until the last moment before arrival, is reprehensible and moreover is in effect a flagrant violation of the purpose and intention of our Canadian quarantine regulations. I am assured that you will support your officer in a refusal to accept certificates so improperly issued.

On November 14 last the new hospital building then in course of erection was blown from its foundations and completely wrecked. Rebuilding was begun in March, and is now complete with the exception of the installation of the heating apparatus. The boilers are here, but tenders have not yet been called for for their erection.

The two new detention buildings are practically finished and can be used during the coming winter if it becomes necessary.

The outlook is that we shall have the busiest winter season in the history of the port, and I much regret that the work of connecting the station with the city water service has not been pushed on to completion. There is now no prospect that the water can be turned on at the station this year.

I have the honour to be, sir,

Your obedient servant,

J. E. MARCH, M.D.,
Quarantine Officer.

The Honourable
The Minister of Agriculture.

No. 5.

(HORACE RINDRESS, M.D.)

NORTH SYDNEY, October 31, 1905.

SIR,—I have the honour to submit my report for the year ended October 31, 1905.

The total number of vessels inspected for the year just ended is 77. I am pleased to say that no quarantinable disease was brought to this port during the year. The caretaker's residence and the hospital buildings have been repaired and painted, and are now in very good condition. The hospital grounds have been surrounded by a wire fence. The new wharf, which is nearing completion, will afford very satisfactory accommodation. The water is not good, nor is the supply sufficient for all purposes. I would respectfully suggest the sinking of an artesian well.

I have the honour to be, sir,
Your obedient servant,

HORACE RINDRESS, M.D.,
Quarantine Officer.

The Honourable
The Minister of Agriculture,
Ottawa.

No. 6.

(F. O'NEILL, M.D.)

LOUISBURG, C.B., October 31, 1905.

SIR,—I have the honour to submit herewith my annual report for this quarantine station for the year ended October 31, 1905.

The total number of vessels examined for the year, 22, with 539 men; this is an increase of 5 over last year.

I am pleased to report that no quarantinable disease was brought to this port for the past year.

I would beg to leave to suggest that some provision be made for the purchase of suitable grounds for a station and the erection of a hospital thereon in the near future. Lack of accommodation would greatly handicap work at this station should any contagious or infectious disease arrive here, especially during the winter.

I have the honour to be, sir,
Your obedient servant,

FREEMAN O'NEIL, M.D.,
Quarantine Officer.

To the Honourable
The Minister of Agriculture,
Ottawa.

No. 7.

(PETER CONROY, M.D.)

CHARLOTTETOWN, P.E.I., October 31, 1905.

SIR,—I have the honour to submit my report for the year ended October 31, 1905. There was no quarantinable disease found on board any vessel arriving at this station during the past year.

The total number of vessels liable to inspection under existing regulations was nine.

The increased accommodation for storing, washing and disinfecting recommended in my last report is now about being provided. The roadway along the shore has also been widened to a sufficient extent over the greater part of its course, but for a distance of about one hundred yards the road, as at present surveyed, runs down on the tide-washed shore, so that passage over it is almost impossible in stormy weather. I would therefore recommend that the road at this point be also moved up on to the dry bank.

All of which is respectfully submitted.

I have the honour to be, sir,
Your obedient servant,

PETER CONROY, M.D.,
Quarantine Officer.

The Honourable
The Minister of Agriculture,
Ottawa.

No. 8.

(J. MACDONALD, M.D.)

CHATHAM, N.B., October 31, 1905.

SIR,—I have the honour to submit my annual report for the year ended October 31.

Sixty-four vessels were inspected at this station during the quarantine year. No disease of an infectious nature was found and all were admitted to pratique after careful inspection.

A small but badly needed wharf or landing was constructed on Middle island during the past summer.

The hospital buildings are in fair condition, but might be improved by the addition of a little paint.

I have the honour to be, sir,
Your most obedient servant,

J. MACDONALD, M.D.,
Quarantine Officer.

The Honourable
The Minister of Agriculture.
Ottawa, Ont.

No. 9.

(A. T. Watt, M.D.,)

Victoria, B.C., October 31, 1905.

Sir,—I have the honour to submit this my report on the William Head quarantine station for the year ended October 31, 1905.

The twelve months just ended have been without particular incident. No vessel had to be detained in quarantine owing to the presence of small-pox or other of the graver quarantinable diseases. Five cases of measles and one of dysentery were removed from vessels and treated in hospital here until recovery.

The number of vessels passed was 176. There is a decrease shown as compared to past few years. It is owing in large part to the exemption from inspection made of vessels in coasting trade from San Francisco and ports north thereof. This exemption was made effective on January 1, 1905, and was conceded on account of the improved health conditions in San Francisco and the other ports, no case of plague having been discovered in San Francisco since March 1, 1904, and the outbreaks of small-pox having everywhere subsided. Other factors accounting for the decrease in the arrival of vessels were the continuance of the war between Japan and Russia, causing the retention of the steamers of the Nippon Yusen Kaisha in the transport service, and the fact that the Northern Pacific Steamship Company has not as yet made Victoria a regular port of call with the new steamers which replaced the old fleet formerly coming regularly.

The number of Asiatic steerage passengers has fallen very considerably. The per capita tax of $500 on Chinese has prevented new arrivals entirely, while the war has had the effect of keeping the Japanese from emigrating to any extent. The Chinese now coming are those who have been home on a visit or those destined for other countries, and the same may be said of the Japanese. There were 2,836 Chinese steerage passengers inspected and 5,378 Chinese members of crew. Japanese in steerage were 2,484, and in crew 1,278. Other Asiatics numbered 221. These were subjected to routine disinfection of person and effects at ports of departure and given special examination on arrival here. There were 51 stowaways found and disinfected on board ship.

The conditions in ports with which we are in most constant communication have been much improved so far as the prevalence of epidemic disease is concerned, and to that fact together with lessened chances, with fewer arrivals, of importing disease, must be attributed the immunity from occurrence of disease enjoyed by steamers coming here. Of coures, too, the precautions now taken in the way of examination, vaccination and disinfection of passengers before embarkation must be credited with a share in bringing about this freedom from disease on board ship.

During the past year many improvements were made at the station. New bath rooms for first-class passengers were completed. These are in a brick building finished with hard plaster, impervious and thoroughly sanitary. A house for the electrician and a house for the guards were also built. A site for the guard house as well as a right of way outside of the boundary fence was acquired. This allows of the keeping of the guards outside of quarantine, a matter of importance, as if a man be found unsuitable or unreliable he can be at once discharged. This could not be done when the guards had come in contact with people detained in quarantine. Then with the patrol being outside the fence, there is not the same opportunity for anyone to elude the guard or to attempt bribery.

Extensive repairs were effected to outer end of deep water wharf. The brace piles in fifteen of the bents were renewed and new stringers and planking laid on that portion of the wharf, that is, for about 150 feet. When new stringers and planking are laid on the rest of the wharf and the copper sheathing patched and reinforced where necessary, the wharf will be in thorough repair. All the piling is now good. A shed to put baggage cars under over and a waiting room were erected near the wharf. A covered wagon for conveyance of passengers and their effects from disinfecting buildings to detention quarters was purchased. This is particularly required during rainy weather.

New 'two decker' iron spring beds were put in saloon passenger building and the steerage buildings were fitted with galvanized iron steamer berths. A number of substantial spring cots were also procured. The sleeping accommodation for all classes of passengers is now of the best.

A further number of cells was added to the storage battery, bringing the voltage up to 110, so that it has been possible to have light in the houses after plant has shut down. This has heretofore been at 11 p.m., but since storage battery has been connected with houses, and the range lights as well ,it has been possible to shut down an hour earlier. By running plant to usual time in winter, the storage battery can undoubtedly be relied upon to furnish what lights will be required for the mornings, and thus save starting up the plant again at 6 a.m., as has been the practice. A considerable saving in fuel is thus effected and fully demonstrates the utility of the storage battery under conditions here.

The contract has been let for a new boarding steamer for the station. The new vessel is to be of steel, 100 ft. in length, 20 ft. beam, and 12 ft. depth, moulded, and of 300 indicated horse-power. She will be built to Lloyd's rules for 100 A class, so that she will be thoroughly seaworthy and capable of going out in any weather experienced here.

The present quarantine steamer *Earl* was the means recently of saving the government a large amount of money. The C.G.S. *Quadra*, of the lighthouse service, went on the rocks about three miles from the station, and the *Earl* having steam up, as she has always in order to be ready for boarding, went at once to render assistance, and was able to get the *Quadra* afloat. This was just before a heavy gale sprang up which would undoubtedly have caused the *Quadra* to break up had she remained in the position she was in a couple of hours longer. It would probably have cost from $80,000 to $100,000 to have replaced the *Quadra* had she been lost, so that there is something which can be set to the credit side when the expenses of maintaining a quarantine steamer here are considered.

I have the honour to be, sir,

Your obedient servant,

A. T. WATT, M.D.,
Supt. B. C. Quarantines.

The Honourable
The Minister of Agriculture,
Ottawa.

No. 10.

(W. H. K. Anderson, B.A., M.B.)

Victoria, B.C., October 31, 1905.

Sir,—I have the honour to submit the following report of the laboratory work at William Head station during the quarantine year 1904-05.

The efficacy of several disinfectants submitted by the department has been tested. One case (a Japanese steerage passenger) was proved by bacteriological examination to be non-quarantinable. Various pathogenic cultures have been kept on hand and studied as a routine practice. There has been some addition to the laboratory equipment.

I have the honour to be, sir,

Your obedient servant,

HAROLD ANDERSON,
Medical Assistant.

The Honourable
The Minister of Agriculture,
Ottawa.

No. 11.

(R. L. Fraser, M.D.)

Victoria, B.C., October 31, 1905.

Sir,—I beg to submit my report for the year just ended.
Number of foreign coasting vessels touching Victoria, 974; number inspected, 2.
No contagious or quarantinable disease was found on any vessel inspected.
All coasting vessels touching here were exempt from inspection during the entire year.

I have the honour to be, sir,

Your obedient servant,

R. L. FRASER, M.D.,
Quarantine Officer.

The Honourable
The Minister of Agriculture.
Ottawa.

No. 12.

(L. N. MacKechnie, M.D.)

Vancouver, B.C., October 31, 1905.

Sir,—I have the honour to submit this my report for the year just ended.

One vessel has been inspected.

No case of infectious or quarantinable disease came under my inspection during the year.

I have the honour to be, sir,

Your obedient servant,

L. N. MACKECHNIE, M.D.,
Quarantine Officer.

The Honourable
The Minister of Agriculture,
Ottawa.

No. 13.

(J. Patterson, M.D.)

Winnipeg, November 1, 1905.

Sir,—I have the honour to report that during the past year 3 cases of small-pox were detected at Moosejaw; 1 case east of Cardston; 1 case at Medicine Hat; 24 cases at Didsbury; 1 case at Wetaskiwin, and 2 cases at Olds. In all 32 cases.

All of these were newly arrived immigrants from the United States, chiefly from Nebraska, except one, a resident of Manitoba returning from a visit to Vancouver.

Seven of the cases were severe, the others moderate. All were strictly quarantined, and the infection did not spread to any of the older residents of the Territories. All recovered.

The last case occurred in May. In September one case was reported to me from near Moosejaw. I referred the supervision of it to the government of the new province of Saskatchewan. With this last exception the Territories have been absolutely free from the disease during the last five months.

I am, sir,

Your obedient servant,

JAMES PATTERSON, M.D.

The Honourable
The Minister of Agriculture,
Ottawa.

No. 14.

(A. C. Smith, M.A., M.D., C.M.)

Tracadie, N.B., October 31, 1905.

Sir,—I have the honour to submit for the information of the department my annual report on the leper hospital at Tracadie, N.B., for the twelve months ending to-day.

Omitting the name of the patient referred to in my last report as being out on leave-of-absence, who remains free from any external symptoms of leprosy, and who is about to be married, there remain to-day on the register of the institution the names of sixteen inmates—nine males and seven females. The ages of these inmates are respectively as follows:—Eleven, sixteen, eighteen, twenty-five (2), twenty-six, thirty, thirty-five, thirty-seven, forty, forty-one, forty-seven, sixty-one (3), sixty-three. One, a man aged forty, and reported last year as being in the first stage of the disease, has recently been cured. Of those remaining, six may be classified as being in the first, seven in the second, and two in the third, the final stage of the malady.

There were no deaths during the year. Two new cases were admitted, one from this parish, the other from one of the surrounding districts. To one of these a child was born in the lazaretto, and a good home immediately found for it.

In my experience with lepers, now extending over many years, I find that their physical condition is good just in proportion to the amount of nourishing diet and medical care bestowed on them. Besides suitable food lepers require warm clothing and plenty of out-door air. During the summer months our patients live much out doors, and, with the exception of the advanced cases, are comparatively free from sickness and suffering. But during the winter, while much confined to the house, they are always sick, always ailing in some way or other. At that time of year they are very liable to enteric and pulmonary affections in addition to the intercurrent ailments, and all by the complication made difficult to treat, and in need of the special skill engendered by special experience. The inmates of the lazaretto, although isolated from the world, enjoy all the comforts obtainable, including the unremitting kindness and attention given them by the religious ladies in charge.

Since the introduction of special treatment by chaulmoogra oil, strychnia, &c. our lepers are much encouraged by the very apparent benefits, even in the cases of those who began the remedies late in the disease. With us marked amelioration has been obtained in every case, and in several cases a cure is, I believe, being effected. On the 28th of last month, the patient referred to above, aged 40 years, and who was admitted in 1900, has been permitted to return to his family on leave of absence. The macular patches on his face and body, ulcerations, and all other symptoms have entirely disappeared. Even when all evidences of the disease have gone it is better to continue the treatment for some time. This man will be an out patent and will continue the use of the remedies.

The treatment of leprosy, the world over, has at last been raised into scientific practice. Dr. Dyer, of New Orleans, states that : 'Leprosy begins with the acceptance in the economy of the bacillus, and if it finds a fit soil in which resistance is below the normal, it spreads, in degree, to one or to every organ in the body. Its colonists are like the people of a sturdy race, finding new fields of entry, and wherever a good location is determined, there they settle, and then next consume in their development the tissues in their vicinity until the germ survives and the tissue

dies. Remedial measures are directed at flooding the field of infection, massing an amount of tissue on which the bacillus cannot feed, but which acts as fuel for the development of normal tissue; this, aided by the natural process of nature, gradually lays siege to the undeveloped foreign tisue until this is carried off or disseminated through the organs of elimination of the human body. 'With added care and treatment, with measures directed at increasing the resistance, this may be raised to a point where the disease can no longer hold its place in the economy and the patient recovers from the disease sufficiently to be free of all evidence during the rest of his life.' These are highly important words.

In view of the fact that in the early history of leprosy in these districts there were four times as many cases as at present, it will be seen that the lazeretto is fulfilling the object for which it was established.

While many precautions are now being taken to stamp out tuberculosis, I fear that not sufficient warning is given to the public against the contagion of leprosy, especially as there are now so very many cases of this disease in the territories belonging to the neighbouring republic. From all quarters of the globe we are constantly hearing of just such cases of contagion as the following:—In 1850, a French Canadian left his home in the Three Rivers District,, Province of Quebec, where he could by no possibility have acquired the disease, and removed to the United States. In 1860 he went to the Hawaiian Islands. Since 1887 his name has been on the list of inmates in the leper hospital on Molokai.

I have the honour to be, sir,
Your obedient servant,

A. C. SMITH.

To the Honourable
The Minister of Agriculture,
Ottawa.

No. 15 .

(CHAS A. L. FISHER, J.P.)

October 31, 1905.

SIR,—I have the honour to submit this my report as Public Works (Health) Inspector, for the twelve months ended October 31, 1905.

During that period I have traversed the territory in the Dominion from the Atlantic to the Pacific coasts, having personally visited and inspected all such works covered by the Public Works (Health) Act, 1899, as have in any way been brought to my notice, some of them having been inspected by me as often as two and three times during the said term.

The year has again been an exceptional one, in the almost general non-appearance of contagious and infectious diseases among the men employed on the various public works of the Dominion coming under my inspection, there being only two outbreaks of small-pox, in two of the railway camps, one patient in each outbreak, and on the prairie, in the far north-west, some cases of typhoid fevor and diarrhœa, owing to impure water being used by some of the men contrary to the instructions of medical officers in charge of camps.

Early last February, there was reported to be a serious outbreak of small-pox at James McDonald's camp, near Hamlet, Ont., on the line of construction of the James Bay Railway, which having come to the knowledge of some reporter, had evidently been enlarged upon, published in the newspapers, and thereby, quite a fright was created in the surrounding villages, but on my going to the camp to investigate, I found two men quarantined (because they had been sleeping together) one of whom had been on a prolonged spree, had not partaken of a square meal for about a month, and in addition had venereal disease. This man came to the camp, stopped using intoxicants, and gorged himself with strong victuals, three times a day, thereby causing an outbreak or eruption on his body, and Wm. A. McLeod, M.D., the resident medical officer at the camp (though satisfied that the eruption was not small-pox), as a precautionary measure, quarantined both men, and they were all right and at work again in about a couple of weeks.

In the beginning of March last, I received from F. Montizambert, I.S.O., M.D., Director General of Public Health, a copy of a very serious complaint, emanating from the far north-west, to the effect that 'at tie and log camps in the neighbourhood of Erwood, Sask., N.W.T., the men employed thereon, were taxed $1 monthly per man, for medical attendance, that such atendance was not being properly given, that sufficient medicine and medical supplies, were not provided, that patients had to be driven over unrepaired roads to hospital, and that such conditions and treatment existed in most railway camps in the west.'

At the same time the Director General informed me, 'that you desired me to proceed there at once, and make a most careful inquiry into the facts and conditions as narrated above, to particularly go up and down among the men whose interest is that we are specially desirous of protecting, find out from them what their grievances and feelings are, and make the fullest possible inquiry in the matter.'

In compliance with your wishes, I proceeded to Erwood, Sask., and the various camps in that neighbourhood, and on my return, reported to the following effect:—

That instead of buying ties and logs from private individuals, as formerly done, the railway construction work in the neighbourhood of, and north-west of Erwood, had been discontinued, and that the construction camps had been turned into tie and log camps by the contractors, but with the same medical supervision as previously set forth in my annual report of October 31, last.

I found these camps to be situated in the Northwest Territories, about sixty miles north-west of Erwood, to be three in number, known as Keith's, MacMillan's and Dunn's, and they are looked after by Dr. Oatway, as medical supervisor, who is well provided with medicines, has temporary hospital acommodation, makes his headquarters and residence at Keith's camp, and visits the other two camps several times weekly.

In cases of serious accidents or disease, requiring long and careful attention to make recovery, patients, after being attended to by the resident medical officer, are sent by a construction engine and caboose, comfortably housed in the latter, to the Swan River Hospital, and the charges for their keep and attendance there, are paid by the contractors.

In conversation with various employees of these camps, I found no complaints about the medical fee charged, the medical supervision, or the hospital accommodation provided.

There are in the same neighbourhood, other large camps known as Moore's, but they are private concerns, do not get out ties or logs for railway construction or contractors, have a large mill, and cut lumber for buildinig purposes. They do not come under the application of the Public Works (Health) Act, 1899, but if they did, from conversation I had with several of their employees I met at Keith's camp, there seems to be no complaint against them.

In another direction of the Northwest Territories, and about fifty miles from Erwood, there are two other contractors' camps getting out ties and logs for rail-

way construction, which are known as MacKenzie's, and Red Deer lumber company's. Both these camps are covered by Dr. Bottomly as medical supervisor, who makes his headquarters and residence at MacKenzie's camp, and visits the other camp about daily, they being only five miles apart.

The doctor is well supplied with medicines, and has temporary hospital accommodation, but patients requiring long and careful attention, are transported to Erwood in comfortable sleighs, and from there by rail to Swan River Hospital, at the expense of the contractors.

In conversation with the men of these camps, I heard no complaints with regard to the charge for medical fees or supervision.

There was, however, about five miles apart from either of the last two mentioned camps, a large lumber camp, which had, I understand, been making a charge on the men for medical services, without having any resident officer, patients (when necessary) being sent to the Swan River Hospital, at the expense of the proprietor of the camp, which was a private concern, did not get out ties or logs for railway contractors or construction, and did not come under the application of the Public Works (Health) Act. This camp was broken up a couple of days previous to my arrival in the neighbourhood, the lumber limits having been sold to the Red Deer lumber company.

This was probably the camp about which the complaint in question was made, but, as it did not come under the application of the above named Act, I would suggest that any complainant in future, be asked to give the exact location of the camp or work, the name of the contractor or company, and such information as would leave no doubt as to what camp or work the complaint covered, then a satisfactory investigation could be made at said camp, without leaving a doubt about other camps or works, as contractors who are carrying out the regulations, are not pleased at having unjust complaints made covering their works.

Railway construction camps in Manitoba have been closed down for some months, but when in operation they have all had sufficient medical supervision.

Early in July last, a complaint reached me against the Atlantic Construction Company, of Shelburne, N.S., to the following effect: That they refused to build hospitals. That in the autumn of last year, their men brought an acute contagious disease with them, and the company refused to provide for them. That the whole community suffered from the plague, as a result of there being on hospitals in which sick men could be placed. That at the end of last year an Italian lay ill in the camp with no one to provide for him, who required operation which could not be done in the camp. That at present there is an old man of sixty years of age, suffering from a broken hip, and has no person to look after him. That west of the Roreway river, no contract has been made with any doctor to attend the labourers.

In compliance with the information received, to the effect that you desired me to make an investigation into the conditions obtaining on the works of the Atlantic Construction Company, with a view to ascertaining if the requirements of the Public Works (Health) Act Regulations had been complied with, I made a special trip to Shelburne, N.S., and the said construction works, and reported thereon, to the following effect:—

The Atlantic Construction Company have the contract for that part of the Halifax and South-western railway not yet completed, and lined out from Liverpool, N.S., to Barrington Passage, N.S., a distance of about seventy-nine miles.

This they have let out in seven sub-contracts, and the whole distance is covered and supervised by eight duly qualified physicans, which would give an average of about ten miles each.

The medical officers are, G. W. Smith, M.D., of Liverpool, N.S., Dr. Lloyd, of Lockeport, N.S., L. O. Fuller, M.D., of Shelburne, N.S., S. W. Burns, M.D., Jas. Morton, M.D., both of Shelburne, J. D. Dunsmore, M.D., of Port Clyde, N.S., Dr. Wilson, of Barrington Head, N.S., and Dr. Banks, of Barrington Passage, N.S.

The number of men employed along the whole work is 840, which would give an average of 120 men under each sub-contractor, so that there is no large body of employees located in any one section.

The company admit that they did not build hospitals, because, owing to the work running through a well settled country, they could, and did nearly always, obtain a suitable building for the purpose.

The company positively deny that their men at any time brought an acute contagious disease with them, and say there were some cases of typhoid among their men, but that they were promptly isolated and taken care of until cured, that they built an hospital specially therefor, which was looked after by Dr. Lloyd, who had male nurses in attendance.

I may here say, that the company produced their books, and showed me where they had paid out for the erection of the hospital, also the receipted bill therefor, and bills for the cost of the nurses at the rate of $1.35 per day and board.

The company claim that the disease did not break out in the camps, but in other quarters, and if there was any plague, they were not responsible.

As to the Italian who required operation, the Company say that the man was sent to the Halifax hospital at their expense, and that he had all necessary care and provision while in camp.

I may here again say that the company showed me receipted bills for this man's care in the Halifax hospital, and also bills for other patients they sent there.

As to the old man of sixty-three years of age, suffering from a broken hip, I obtained the following information: The accident occurred June 23 last, and after work hours, not on the works or any connection therewith, but on the public road, and was caused by the man attempting to get on a farmer's wagon, while the horses were in motion. He was taken to the camp, made as comfortable as possible, the medical officer sent for, and a male nurse placed in charge of the patient there, at the expense of the company, until they had the man removed to more comfortable quarters in Shelburne.

This information I obtained from the sub-contractor of said camp, at a personal interview with him, and this was confirmed on my interviewing the manager of the construction company.

I may here say, that previous to my visit, the company had made arrangements with a Mrs. Bower, of Shelburne (who had ample quarters), to house, board and nurse all patients, but contagious disease ones, sent her by them, and there I personally visited the old man with the broken hip, found him comfortably quartered in a room by himself, and on questioning him, he said he had been kindly treated, was quite satisfied, and was doing all right.

In regard to no contract having been made with any doctor to attend labourers west of the Roreway river, I have to say, that I saw and read over the contracts made with, and signed by the eight medical officers named above, and covering the whole of the constrction work between Liverpool and Barrington Passage.

I drove over the line of work, visited the camps and interviewed personally all the sub-contractors, with one exception, and they spoke very favourably of the way the Construction Company cared for their men when sick or disabled by accident, and assured me that they were well cared for and provided with nurses when necessary. In conversation with some of the men employed on the various works and camps, I questioned them as to their treatment, food and lodging, and they seemed to have no complaints.

The medical officers of the works, whom I saw, gave me similar reports as the sub-contractors, and the manager of the company said they were quite willing to do what was necessary under the regulations, in order to protect their men and keep them on the work, and this I know they have done during the past two years in constructing other parts of the same road.

The company have ordered hospital tents for each camp, and when they are up and equipped, taking into consideration the well settled country through which the line runs, the small body of men located in each camp, the number of medical officers employed in covering such a short distance, the recuperating quarters at Shelburne and other camps, and the use of the Royal Victoria Hospital at Halifax, I consider that the regulations under the Public Works (Health) Act, 1899, are being fully carried out as far as necessary by the said Atlantic Construction Company, on the construction work of the Halifax and Southwestern railway.

In regard to the above reported matter, I made special trips for investigation, and am pleased to have been able to report as favourably thereon. These works were all visited again on my annual tour of inspection, and will be found further reported on below, under special headings.

I am pleased to again be able to report that on my regular tour of inspection of the public works of the Dominion for the past year, I found the medical service given, the hospital accommodation provided, and the sleeping quarters or housing of the men, to be equal to the very good condition in this way, reported last year.

The following is a detailed report of the public works I have personally visited and inspected during the past twelve months, as coming under the regulations of the Public Works (Health) Act, 1899 :—

RAILWAYS.

The number of works of this kind have been about the same as during last year, some of the latter having been completed and new ones commenced, but the most important ones have been so rushed that a further greatly increased average has been added to the railway mileage of the Dominion, and a more extended tract of fine wheat-growing lands than ever opened out for settlement.

CANADIAN PACIFIC RAILWAY.

This company has had under construction in the past twelve months, fourteen branches and extensions, in the provinces of Ontario, Manitoba, the Northwest Territories and British Columbia, as against seven in the previous year.

Having visited all the said works in my official capacity, I am pleased to report that at such visits I found good hospital accommodation provided, the men comfortably housed and well fed, the camps in good sanitary condition, and a duly qualified physician as medical supervisor over each section of camps.

With two exceptions, there has been no outbreak of contagious disease, and the general health of the men has been good.

I give below the extent and location, with other particulars, of these fourteen various works. Sudbury—Toronto branch (Sudbury, Ont., to Byng Inlet, Ont., 60 miles). The contractors for this work are Messrs. Foley Bros., Larson and Company, with headquarters at Wahnapitae, Ont., near Sudbury.

About 2,500 men were employed, who were distributed over from twenty-five to thirty camps, and were boarded and housed in tents and other quarters by the contractors.

There had been two outbreaks of small-pox in these camps, one patient in each outbreak, but by prompt and effective measures, the disease was limited to the one patient in each outbreak.

There had been the usual amount of sickness and minor accidents, but the general health of the men had been good .

The camps were well situated and in good sanitary condition, and the buildings commodious and comfortable.

Two very good hospitals are established by the contractors, one located at the Wahnapitae river, four miles south of the main line connection, the other located on the Pickerel river, forty miles from the former, and twenty miles from Byng Inlet, and hospital tents are on hand in the various camps in case of necessity.

F. J. Ewing, M.D., chief medical officer of the Canadian Pacific Railway Company's construction work in Ontario, makes his headquarters on the line, and has two assistants, Dr. Ferguson and Dr. Aineley, also nurses and cooks for the hospitals. Sudbury—Toronto branch. (Bolton, Ont., to Parry Sound, Ont., 128 miles.) The contractors for this work are Messrs. G. S. Duks & Company, of Toronto, now the Toronto Construction Company, Limited.

About 1,000 men were employed, who were distributed over a number of camps, and boarded and housed by the contractors.

There had been no contagious diseases, and the health of the men had been excellent, the camps were well situated, and in a sanitary condition.

No permanent hospital has been established, as there are several public hospitals within easy access, but the medical officers have temporary hospital accommodation.

The medical officers in charge of the various camps are A. F. Reyner, M.D., of Palgrave, Ont., Dr. Harvie, of Coldwater, Ont., W. H. Wright, M.D., of Tottenham, Ont., Jas. Campbell, M.D., of Tottenham, and Dr. Stone, of Parry Sound, Ont.

Sudbury—Toronto branch. (Coldwater to the Severn river, Ont., about 12 miles.) The contractors for this work are Messrs. Battle, Conlon and Armstrong, of Thorold, Ont.

Only about 100 men were employed, many of them residing in the neighbourhood, there being only one small camp where a few men were housed and fed by the contractors, and the health of all had been good.

Lacombe and Wetaskiwin branches. (50 miles Lacombe extension and 25 miles Wetaskiwin extension). This was the continuation of the work of last year, and was under contract to Messrs. Foley Bros., Larson and Company.

Between 300 and 400 men were employed on these works, housed in tents and boarded by the contractors.

There had been no contagious disease, and the health of the men had been good.

Temporary hospital accommodation was provided, and the general hospital at Calgary was used when necessary for serious cases.

Dr. Ewing was in charge as chief medical officer of Foley Bro.'s work, and had an assistant looking after the men, in the person of Dr. Walker,

Wetaskiwin branch. (A further extension of 25 miles.) This work was under contract to Messrs. Breckenridge & Lund. Only about 100 men were employed, who were housed in tents, and boarded by the contractors.

No contagious disease had occurred, the health of the men was good, and they were medically looked ofter by Dr. Walker, who had temporary hospital accommodation for them when necessary.

Wetaskiwin branch extension. (40 miles to east.) This work was started late this season, and is under contract to J. D. McArthur, of Winnipeg..

About 200 men were employed, who were housed in tents, and boarded by the contractor.

There had been no serious illness among the men, the camps being well located, and kept in good sanitary condition.

Hospital tents were provided, and A. R. Cunningham, M.D., had the medical supervision of the men.

Pheasant Hills branch. (This is a continuation of the work mentioned in my last report, as from Newdorf to Jumping Deer creek.)

Messrs. Foley Bros., Larson & Company were the contractors for the grading, the tracklaying being done by men under the supervision of the Canadian Pacific Railway Company.

About 300 men were employed in all, and distributed over the various camps being housed in tents and boarded by the contractors and the C.P.R. Company.

There had been no outbreak of contagious disease, and the health of the men generally good.

There was a good temporary hospital at Lipton, Assa., on the line, with Dr. Black in charge, assisted by Dr. Adams. This work was just about finished.

Brookdale Branch (extension of 10 miles west) Messrs. Foley Bros., Larson & Co., were the contractors.

About 150 men were employed, housed in tents, and boarded by the contractors.

No outbreak of contagious disease had occured, and the health of the men was good.

Temporary hospital accommodation was provided. Dr. Black was in charge as medical officer, with Dr. Thompson as assistant at Brookdale.

Wolseley-Reston line (Reston, Man., to Wolseley, Assa.) This work was under contract to J. D. McArthur, of Winnipeg, the tracklaying being done by Canadian Pacific Railway operating department, under Mr. J. J. Scully, superintendent, at Brandon.

About 150 men were employed and were housed in tents and house cars, and boarded by the contractor and company.

There had been no contagious disease, and the general health of the men had been good.

Temporary hospital accommodation was provided, the medical charge of the men being under Dr. Chapman, of Reston.

Lauder extension (a short spur from Lauder). This was under contract to P. R. Lamb, of Winnipeg. Only 58 men were employed, all of whom were in general good health.

No regular medical officer was employed.

Moosejaw extension (10 miles northwest). This was under contract to Messrs. Jackson & McMenemy. Only a small body of men were employed, who had been in general good health.

No special medical officer was employed, not being necessary.

Saskatoon extension (30 miles west). This work was under contract to J. D. McArthur, of Winnipeg, and had only just been started.

About 200 men were employed, who were housed in tents and boarded by the contractor.

Hospital tents were provided, and the health of men good.

Drs. McKay & Willoughby were the medical officers in charge of the employees.

Teulon branch (extension of 10 miles). This was also under contract to J. D. McArthur.

Only 50 or 60 men were employed, who were housed in tents, boarded by the contractor, and were in good health.

No special medical officer was necessary.

Yahk branch (from Yahk, B.C., 8·1 miles). Messrs. Breckenridge & Lund were the contractors.

About 200 men were employed, who were housed in tents, and boarded by the contractors.

There had been no contagious disease, the health of the men being excellent.

Two local doctors in the neighbourhood were employed to attend the men .

NICOLA, KAMLOOPS AND SIMILKAMEEN RAILWAY AND COAL COMPANY.

Nicola Valley branch (Spence's Bridge, B.C., to Nicola Mines, about 45 miles). Messrs Loss, Macdonnell & Co., are the contractors for this work.

About 800 men are employed, who are housed in tents, and boarded by the contractors.

The health of the men has been excellent, and no outbreak of contagious disease has developed. The camps are well located and kept in a sanitary condition.

An excellent hospital has been established on the line of construction, about 12 miles from Spence's Bridge, in a spacious and well equipped tent, and two nurses are regularly employed therein.

R. H. Kerr, M.D., is the chief medical officer, and he has another doctor as assistant, both residing on the works, and being well supplied with medicines and other necessaries.

CANADIAN NORTHERN RAILWAY.

This company has had under construction since my last annual report thirteen extensions to their lines in Manitoba and the Northwest Territories, as against eleven in the previous year.

Having personally inspected the works on each of said extensions, I have to report that I found both the company and the contractors carrying out carefully the regulations under the Public Works (Health) Act, 1899, the hospital accommodation provided being up to the requirements, the men furnished with ample wholesome food and well housed, mostly in tents, the camps kept in a good sanitary condition, and having thorough medical supervision by one or more duly qualified physicians, who were under the direct charge of R. Mackenzie, M.D., and C. A. Mackenzie, M.D., both of Winnipeg, as chief medical officers of all construction work of the Canadian Northern Railway Company, and these gentlemen, as well as the chief employees of the company, gave me every assistance in their power towards making the necessary inspections.

There were no infectious or contagious diseases at any of these works, with the exception of a few cases of typhoid fever, and the general health of the men could hardly be better.

The locations, with more detailed particulars of the works, will be found below.

Main line extension (between Humboldt and Edmonton, Alta.). The contractors for the grading are Messrs. J. D. McArthur & Company, of Winnipeg, and the track laying, which was last season in the hands of Messrs. Robinson & Company, is now being done under the supervision of the Canadian Northern railway.

About 2,000 men in all were employed on the work, distributed throughout the several sections and the various camps, comfortably housed in tents and house cars, and well supplied with first-class food by those who boarded them.

There had been no contagious or infectious diseases, with the exception of a few cases of typhoid fever, the general health of the men being excellent and no deaths having occurred from either disease or accident.

Very good temporary hospital quarters were supplied for each section, and hospital tents were on hand for use if necessary.

Eight duly qualified physicians had medical supervision of the various sections, viz.: P. C. Crosby, M.D., in charge of steel gang; D. B. Neeley, M.D., at Humboldt, L. B. Wilmot, M.D., at North Battleford, W. T. Rush, M.D., and Dr. Turner, at Vegneville, E. B. Oliver, M.D., at Lloydminster, Dr. Braithwaite, assisted by Dr. Dunne, at Edmonton.

Prince Albert division (grading, ballasting and tracklaying from Melfort, Sask., to Prince Albert, Sask.) Mr. Neil Keeth was the contractor for the grading and ballasting, and the tracklaying was being done by Messrs. Mackenzie & Mann.

About 300 men were employed, being housed in tents and house cars, and well supplied with good food by the contractors, and the camps and cars kept in a good sanitary condition.

There were no contagious diseases developed, the health of the men being of the best.

Temporary hospital quarters were provided, and in case of necessity, men were sent to the Swan River Hospital, by a construction engine and caboose, at the expense of the contractor.

R. M. Oatway, M.D., was the medical officer resident among the camps, and as the work extended Dr. Reed was employed to assist on the end towards Prince Albert.

Varsoe line, Messrs. Mackenzie & Mann were constructing this work.

About 600 men were employed, who were housed in tents and boarded by contractors.

No outbreaks of contagious disease had occurred, the health of the men being generally good.. Temporary hospital quarters were provided.

W. B. Clark, M.D., was the medical supervisor.

Carman-Somerset extension (from Leary's to Somerset, Man.) This work was under contract to Mr. Strevel.

Only about 100 men were employed, who were lodged in tents and boarded by contractor.

No contagious disease had developed, and the men generally, were in excellent health. Hospital tents were provided, and J. Rochon, M.D., of Somerset, was the medical officer in charge.

Edmonton extension (from Edmonton to about 40 miles northwest). This work was started late in the summer and about 150 men were employed.

There had been no serious disease, the general health of the men being good. Dr. Braithwaite, of Edmonton, assisted by Dr. Dunne, were the medical officers in charge.

Hartney branch (between Hartney and Virden). About 200 men were employed thereon, who were housed in tents and boarded by the contractors.

No contagious or infectious diseases occurred, and the general health of the men was excellent. Dr. Bigelow, of Hartney, assisted by Dr. Montague were the medical supervisors.

Springfield branch (Winnipeg to Bird's Hill). Only about 50 men were employed on this line, who were housed in tents and well looked after by the contractors. There had been no serious illness, and Dr. Davis, of Dugald, Man., was the medical supervisor.

Carberry branch (Carberry to Brandon). Messrs. Cowan, Mackenzie & Mann, were the contractors for this work, but only 50 to 60 men were employed at tracklaying, and they were under the medical charge of Dr. Montague.

Rossburn branch (Clanwilliam extension). This had been under contract to Messrs. McDonald & McWilliam, but only about 50 men were employed at tracklaying, who were also being looked after medically by Dr. Montague.

Hudson's Bay branch (from four miles from Winnipeg to a connection with a completed line). Messrs. Mackenzie, Mann & Co., had this work in hand. About 100 men were employed, who were well cared for, and their medical supervision was in the personal charge of Drs. Mackenzie and Mackenzie.

The Edmonton and Slave Lake railway (short line out of Edmonton). About 100 men were employed who were housed in tents and well cared for by the contractors. Drs. Oliver and Braithwaite, of Edmonton, were the medical officers of the men.

JAMES BAY RAILWAY.

This work is under the control of Messrs. Mackenzie, Mann & Co., and construction is going on under the charter from Parry Sound, Ont., to Toronto, Ont., in several divisions and under several contractors.

Parry Sound branch (from Parry Sound north six miles). Messrs. Johnson & Beveridge had the contract for this work, which is now completed.

There had been no serious disease among the men, and they were under the medical charge of G. N. Davis, M.D., of Parry Sound.

North half main line (from Parry Sound south to Washago, Ont., about 60 miles.)

This work is under contract to Angus Sinclair, C.E., of Parry Sound, who has let it out in sections to seven sub-contractors, as under: From Parry Sound south for seven miles, Messrs. Henderson and Scott are the sub-contractors. Their camps are in good condition, and the health of the men excellent. S. N. Davis, M.D., of Parry Sound, has been medical supervisor of the men in the camps.

From the 7th to the 12th mile inclusive, Messrs. Kennedy and McDonald were the sub-contractors. This work is now completed, but when under construction, Dr. Davis had the medical supervision.

From the 12th to the 18th mile, J. I. Cote was the sub-contractor, with Chas. H. Gilmour, M.D., of Toronto, as chief medical officer, assisted by Dr. Hacking, of Staney Brae, Ont. This is now completed.

From the 18th to the 21st mile, Messrs. Montgomery and Moffat had the sub-contract, with Dr. Hacking as medical officer in charge. This work is completed.

From the 21st to the 31st mile, Messrs. Giroux and Jamieson were the sub-contractors. A good hospital was provided at Foote's bay, with Dr. Hacking as medical officer in charge, under Dr. Gilmour.

From the 31st to the 36th mile, Messrs. Phillips and Jacobs have the sub-contract, with Dr. Burgess, of Bala, Ont., as medical supervisor.

From the 36th to the 48th mile, the work is under sub-contract to Guy Campbell, and Dr. Burgess looks after the care of the men on this section.

From the 48th mile to Washago, the Orillia Construction Company are the sub-contractors, with Wm. A. McLeod, M.D., as the resident physican looking after the men for Dr. Gilmour.

This is the camp known as McDonald's, with headquarters at Hamlet, Ont., at which last February there was a reported outbreak of small-pox, as previously reported above.

There were about 1,500 men in all, employed on these works, all being in general good health, with no outbreak of contagious disease except the one reported from McDonald's camp.

Temporary hospital accommodation was provided for all camps, and Chas. H. Gilmour, M.D., of Toronto, was chief medical officer.

South half of main line (from Toronto to Washago, about 65 miles). This work is under contract to the Northern Construction Company, Limited, with headquarters at Don Lands siding, six miles from Toronto.

There are about seventeen separate camps on this construction, all under the charge of Chas. H. Gilmour, M.D., of Toronto, who has several assistants.

From Toronto to Mount Albert, Malcolm Galbraith, M.D., is the medical assistant in charge of the men.

From Mount Albert to Beaverton, W. J. Boynton, M.D., of Pefferlaw, Ont., looks after the men.

From Beaverton to Brechin, Dr. Galloway, of Beaverton, has charge of the men.

From Brechin to Sparrow Lake, S. J. Staples, M.D., has the medical charge of the men.

Dr. Burgess has charge of the men for four miles out of Bala.

From four miles out of Bala, to within seventeen miles of Parry Sound, Roy Hacking, M.D., has charge of the men.

About 1,000 men in all are employed on this work, who are housed in tents or temporary buildings, and boarded by the contractors.

No outbreak of contagious disease has occurred, and the health of the men has been generally good.

Very good temporary hospital quarters have been provided by Doctor Gilmour at various points along the line of work, viz., At Doncaster, with Dr. Galbraith in charge. At Pefferlaw, with Dr. W. J. Boynton in charge. At Washago, with Dr. S. J. Staples in charge. At Foote's bay, with Dr. R. Hacking in charge.

Any very serious accidents or cases, requiring long and careful attention, would be sent to the Toronto General Hospital, at the charge of the contractors.

Halifax and South Western Railway. The proprietorship of this road is in the hands of Messrs. Mackenzie, Mann & Co., of Toronto, and when completed, will extend from Halifax to Yarmouth, N.S., with branch lines.

Trains are now running from Halifax to Liverpool, N.S., and from Barrington Passage to Yarmouth.

The part now under construction is from Liverpool, N.S., to Barrington Passage, N.S., to connect the two parts now in operation, and covers a distance of about 79 miles. This work is under contract to the Atlantic Construction company, with headquarters at Shelburne, N.S, and they have let out the work to seven sub-contractors, who are pushing it to completion, under the supervision of the Atlantic Construction company.

I have just returned from inspecting these works for the second time, during the past season, and found that the Atlantic Construction Company were fulfilling the requirements of the Public Works (Health) Act, regulations, thereon, as far as necessary.

Having already reported above, on a special visit of inspection to these works, and given all particulars, I need not repeat the same.

QUEBEC AND LAKE ST. JOHN RAILWAY.

This company are constructing a branch of their road from La TuqueJunction, to La Tuque, a distance of 42 miles.

This work is under contract to Mr. Joseph Paquete, who has from 300 to 400 men employed thereon.

There are about 35 camps covering the route, and the men are comfortably housed in temporary cabins or tents, and are well boarded and looked after.

Louis V. Masse, M.D., is the medical officer in charge of the employees, and is resident on the work.

The contractor has erected a comfortable hospital for the use of the men, but up to the present, it has been little used.

There has been no contagious or infectious disease in the camps, and the general health of the men has been excellent. But one accident has occurred, and that not a serious one.

GREAT NORTHERN RAILWAY OF CANADA.

This railway is now under the control of Messrs. Mackenzie, Mann & Co., who were constructing a branch from St. Jacques Junction to St. Jacques village, Que., a distance of seven miles, under the supervision of Mr. A. J. Gorrie, general superintendent of the railway company.

Only about 50 men were employed, and they live in the surrounding neighbourhood.

There had been no unusual sickness, and no complaints. There was, of course, no regular medical officer in charge of the men employed.

OTHER PUBLIC WORKS.

Dock, ice-breakers and dredging (city of Three Rivers).

This work was being carried on by the Dominion government, and is under contract to Mr. Randolph Macdonald.

A comparatively small body of men was employed, most of whom lived in their own houses and the others were well cared for by the contractors.

There is no regular medical supervisor, such not being necessary. The health of the men was good.

Breakwater, Depot Harbour, Ont. (rip-rap foundations and addition to wharf). This work has been carried on by the Dominion government, and is under contract to Messrs. Davis, Haney & Miller.

Few men were employed thereon at the time of my inspection, the present contract nearing completion.

There had been no contagious or infectious disease, and the health of the men kept excellent. The camps were well located, the sleeping quarters comfortable, and the food of the best. C. Davis, M.D., of Depot Harbour, Ont., was the medical officer in charge of the men and camps.

In closing this my annual report for the year ended October 31, 1905, I deem it a pleasure to be again able to draw your attention to the very apparent abatement of contagious and infectious diseases, the excellent condition and general healthfulness of the men, the sanitary state of the camps on said works, and the careful attention given by the contractors and companies in trying to fulfil the requirements of the Public Works (Health) Act regulations.

I have the honour to be, sir,

Your obedient servant,

CHAS. A. L. FISHER,
Public Works (Health) Inspector.

The Honourable
The Minister of Agriculture,
Ottawa.

REPORT OF THE CANADIAN COMMISSION TO THE LOUISIANA PURCHASE EXPOSITION, ST. LOUIS, U.S.A., 1904.

The Louisiana Purchase Exposition, held in the city of St. Louis, in the state of Missouri, U.S.A., during the year 1904, was instituted to commemorate the purchase by the United States government of the territory then known as Louisiana from Napoleon I, of France. The purchase was effected in the year 1803, and embraced all the territory lying to the southward and west of the Mississippi river at that time under the jurisdiction of France.

The Louisiana Purchase Exposition was conceived on a scale of such magnitude that it was found impossible to carry the proposed scheme into effect in time to celebrate the centennial year of the purchase, 1903, so the time was extended to the year following, 1904. The exposition being of a universal character held under the auspices of the United States government, all foreign countries were invited to participate, and the time for holding the exposition was fixed for the period between April 30 to December 1, inclusive.

Canada being at a very important stage of her national development, and having entered upon the highway of an unprecedented prosperity, the opportunity of bringing her natural resources and her broad areas of fertile lands awaiting settlement more conspicuously before the eyes of the world, was not to be lost, and the government of the Dominion among other foreign countries, decided to participate.

The decision having been made. it was determined to make the participation commensurate with the magnitude of the exposition and the excellence of the opportunity. To that end the exhibition branch was instructed to undertake the gathering of suitable exhibits, the selection of desirable sites in the different exhibit palaces, and a location for the Canadian National pavilion.

Having made early application for exhibit spaces, we were able to secure choice locations in each of the exhibit palaces where Canada was to be represented, and also a suitable site for the Canadian pavilion. A description of the different exhibits is given in another part of this report.

In the general plan of the exposition site, a section was set apart for the location of foreign government buildings. This location was, in our opinion, rather remote from the general activity of the exposition, and our object being to attract the largest number of people possible to our building, we prevailed upon the exposition authorities to allow us to occupy a piece of land in that part of the grounds known as the agricultural section. The location secured was a part of the immense flower garden immediately surrounding the agricultural building, and in close proximity to the great floral clock which was one of the great features of the exposition.

The conditions imposed upon us were that we should undertake the full cost of terracing, sodding and maintaining the landscape during the period of the exposition on a scale equal to that carried out by the exposition authorities in the maintenance of the flower garden above mentioned.

That the extra expenditure in thus preparing, beautifying and maintaining the grounds comprising the plot was justified, was amply demonstrated in the crowds of visitors that the situation naturally threw in our way. Immediately to the east of the site was the United States Life Saving exhibit, which attracted great crowds daily. On the west was the Philippine reservation, with the main thoroughfares leading to and from it passing on either side of our plot. Added to this, the fact that

the group of foreign buildings and the forestry, fish and game building were on a straight line to the north, and that all the traffic from these buildings to the Palace of Agriculture had to pass by our door, a pretty clear idea may be formed of the advantages of our situation. It might still further be urged in defence of the expenditure in connection with our pavilion, and the plot of ground occupied, that we had a daily average of visitors much larger than that of any of the state or foreign buildings which cost twice and three times as much as ours in their erection.

The pavilion itself, constructed somewhat after the fashion of a club house, had a frontage of 100 feet x 100 in depth with broad verandahs on front and sides for the accommodation of visitors to eat their luncheon or rest at their pleasure. These verandahs and the freedom given to the visitors upon them, proved a strong factor in gaining for the building the popularity that it enjoyed. The public conveniences, free ice water, easy restful furniture ,and the homelike air about all the parlors, corridors and reception rooms, gained for the Canada pavilion a reputation for hospitality that was not enjoyed to the same degree, by any other official building on the fair grounds. The furnishings of the pavilion and the works of art with which it was decorated, were all Canadian, and all suggestive of Canada's natural wealth, social, educational and commercial progress. If proof were wanting of the popularity of the Canadian pavilion, it was amply furnished throughout the season by the crowds of people who daily thronged its parlors, corridors and reception rooms or crowded upon its verandahs. Further proof was abundant in the voluntary testimony of hundreds upon hundreds of visitors from the city and elsewhere, who said it was talked about as the only absolutely free building on the grounds, where there was no charge for toilet accommodations or ice water, and where visitors were not only allowed to eat their lunches on the verandahs, but were provided with tables to add to their comfort in doing so.

Besides offices for the use of the commission, the Canadian pavilion included a large room in which were hung large maps showing the character of the country, its railways systems, public lands. Immigration officers furnished by the Department of the Interior, were in daily attendance giving information in regard to the free land offered to settlers in the Canadian Northwest, and distributing literature explaining the conditions upon which it might be obtained. Other literature was distributed from the different exhibit spaces, on all of which was printed a notice inviting visitors to call at the Canadian pavilion for information in regard to the 160 acres of free land offered by the Canadian government.

Adjoining the immigration room, in the rear, was an alcove furnished with a series of illuminated paintings showing the progress of the Northwest settler from his entrance upon the unbroken prairies, to his tenth year, as he appeared on his well cultivated farm and surrounded in his home with a handsome growth of trees. This exhibit proved very valuable, not only in showing the yearly progress of the settler in his general improvement, but in showing the growth of trees, a feature which attracted a great deal of attention and provoked considerable inquiry, more especially from those who had experienced the difficulty in growing trees in some sections of the Dakotas and other parts of the west, south of the Canadian line. The cost of these paintings and mounting them in so conspicuous a way in connection with our immigration work, was in my opinion, more than justified in the great attention they received and in the thousands of questions we were called upon to answer concerning the conditions they so strikingly presented in the life and progress of a Canadian Northwest settler.

AGRICULTURE EXHIBIT.

For the agricultural exhibit in the palace of Agriculture, a space of 12,000 square feet was secured. This was fully occupied with a varied exhibit of grains, grasses, tobacco, roots and other natural products, together with a great variety of food products,

natural and manufactured. The central figure was a trophy of attractive design, standing over 60 feet high, in which was artistically worked over three hundred varieties of grain, grasses, fodder, plants, &c., and ornamented on the outer octagonal sides with landscape paintings showing herds of the leading breeds of cattle raised in the Dominion, and decorated inside with paintings of every variety of native and domestic plants known to the Northwest.

The paintings showing the cattle herds were a conspicuous advantage to the exhibit, as they proved a great attraction and were very freely and favourably commented upon by the American press and public. They not only added beauty, said a prominent American, but they gave in a striking way an increased commercial value to the exhibit.

On either side of this central trophy, is a pedestal of honey and maple sugar respectively, and farther to the rear of the space attractive pyramids of grain in glass jars, tobacco and a great variety of food products displayed in various ways. This exhibit for its installation and comprehensive collection was awarded the grand prize, three special prizes, thirteen gold medals, five silver medals and three bronze medals. And for its general character and interpretation, it received many high enconiums from the public. Col. R. M. Green, of California, commissioner in charge of the Sacremento Valley exhibit, said of it: 'It embraces so much, and shows what the country can do in a businesslike way ; it is the most sensible exhibit in the building, and can teach our people some methods of doing business in that line.' Something to this effect has been said by several state commissioners and superintendents of exhibits in the same building.

HORTICULTURE EXHIBIT.

In the Palace of Horticulture, 8,000 square feet was secured and an exhibit designed and installed that has attracted very general attention, and especially of people from the south and western states.

This exhibit was opend for inspection by the public on April 30, with 94 varieties of apples in their natural state taken from cold storage, many other varieties preserved in glass jars with antiseptic fluids, also over 30 varieties of pears, 70 varieties of grapes, many varieties each of plums and peaches, and an almost endless collection of small fruits, comprising strawberries, raspberries, gooseberries, currants, cranberries, and many varieties of vegetables preserved and exhibited in the same way.

At the back of this exhibit was conspicuously displayed a large painting showing an apple inspection scene on the docks at Montreal, which attracted much attention, and provoked many inquiries regarding the Canadian Inspection Act. The arrangement and installation of this exhibit attracted much attention and favourable comment throughout the season, and the varied collection of fruits shown, proved a great surprise to many visitors who had not supposed that Canada was capable of producing such fruits. The exhibit has accomplished much by way of dissipating an impression too commonly held throughout the south and west of the United States, that Canada was a cold country, and laid quite beyond the peach belt. For its quality and number of apples, the Canadian exhibit was not surpassed by any other display in the horticultural building.

Fresh fruits, as their season came in, were sent down from widely separated districts of the Dominion, and their quality and appearance compared favourably with similar varieties produced in other portions of America. This may be said especially of the smaller fruits, grapes and peaches. When the awards were made, the Canadian exhibit came in for a full share of the prizes, taking one grand prize for the large and comprehensive collection of fruits shown, and another grand prize for the installation and artistic make-up of the exhibit.

MINES AND METALLURGY.

In the palace of Mines and Metallurgy 10,000 feet of space was occupied, and the exhibit installed there has on the whole been more surprising to the public than any other display that Canada made at the fair.

In arranging the exhibit great care was taken to have everything easily accessible, the table cases being arranged so that the contents could be seen from all sides.

The collection represented seven carloads of specimens, weighing in the aggregate 150 tons. Large pyramids of nickel, cobalt-nickel-silver and arsenic, asbestos, corundum, mica, iron, graphite and coal were shown. In addition to the pyramids, there were 70 table cases containing minerals showing general distribution. These cases were especially made for this exhibition, and are so constructed that they can be taken apart and packed in boxes 3 feet 8 inches x 2 feet 8 inches x 6½ inches.

The most striking and original feature of the exhibit was the large vault 14 feet x 16 feet containing gold nuggets and gold dust from the Yukon. This vault was composed of minerals from the different provinces, and attracted universal attention and admiration.

A systematic collection of gold dust and nuggets from British Columbia and the Yukon, arranged by Dr. Haanel, Superintendent of Mines, was favourably commented upon. This exhibit consisted of 93 specimens put up in trays, each containing 1 oz. of gold, with label attached showing assay value and location of claim.

Next to the gold exhibit the collection of asbestos from the Thetford and Black Lake mines, province of Quebec, attracted the most interest. The exhibit weighed over 12 tons, and all the mines in the district were represented.

The mica exhibit proved to be of much interest to visitors. This was the largest exhibit of mica ever sent from Canada, one of the crystals, 3 feet 6 inches in diameter, weighed over 700 lbs. Another specimen exhibited was nearly 7 feet in length and 14 inches wide.

The exhibit of cobalt-nickel-arsenic and silver from New Ontario attracted much attention, especially among scientists. This being the first cobalt ore found in paying quantities on this continent, many inquiries were made about the deposit.

All the specimens were labelled with neat cards bearing the Dominion coat-of-arms.

Much information was given as to mode of occurrence, extent of deposit, and other particulars, in answer to inquiries about the following minerals:—

Molybdenite.
Talc.
Magnesite.
Asbestos.
Mica.
Nickel and cobalt.
Chromite.
Zinc.
Copper.
Iron.
Iron pyrites.
Silver.
Gold.
Manganese.
Tripolite.
Graphite.
Building stones.
Grindstones.
Marble.
Slates.
Barite.
Felspar.
Scheelite.
Peat.
Arsenic.
Pitchblende.

The collection was the largest shown by any exhibitor in the mines building.

Panels showing mineral statistics and other information in regard to mining were placed in prominent positions throughout the space.

Over 30,000 pamphlets and reports on mining in the Dominion were distributed.

Many complimentary remarks were made by scientists and others on the general arrangement of the exhibit, one of which we quote. Doctor Day, Chief of the Division of Mining and Mineral Resources of the United States Geological Survey, and Honorary Chief of the Department of Mines and Metallurgy, Louisiana Purchase Exhibition, said:

'This exhibit of minerals is the best that I have ever seen from Canada, and I have attended all the large exhibitions of recent years. Your plan of showing large masses of workable ores impresses the people interested in mining, and is to be highly commended.'

He also stated that the Canadian exhibit was the most representative collection of economic minerals in the mines building.

The exhibit was awarded two grand prizes, twenty-seven gold medals, twenty-seven silver medals and fourteen bronze medals.

FORESTRY, FISH AND GAME.

In the forestry, fish and game building a space of 8,000 feet was secured and occupied by Canada, and our exhibit there was one of unusual attraction. The main figure was a rustic arch or double span bridge unique in its design, and in its construction was worked over 3,000 varieties of wood, all grown in the Dominion. This information was given to the public in a large gold-lettered panel placed on the side of the bridge. On the bridge and under it, was arranged a collection of the finest specimens of all the game to be found in the forest, plains and waters of British America. Conspicuous in the collection were fine specimens of the white polar and grizzly bear; brown and black bear, buffalo, musk ox, mountain goat, moose, elk, wolf, beaver, and every variety of water fowl and fur-bearing animal known to the fowlers and trappers. Of this exhibit it was said by Dr. Hough, of the Smithsonian Institute, at Washington: 'The most attractive exhibit I ever saw at a world's fair,' and by a wealthy and cultured lady from Virginia: 'How exquisitely beautiful.'

In the same building Canada occupied a space of 400 feet containing an artificial pool of flowing water wherein sported a family of live Canadian beaver to the delight of many hundreds of spectators daily.

In addition to the exhibit in the forestry, fish and game building, Canada made a special display of her forest wealth in a building constructed for the purpose in the rear of the Canadian pavilion, covering a floor space 50 x 100 feet. In this building an effort was made to show the immense timber and pulpwood resources of Canada, and the effort was successful in attracting a pretty general interest and a great deal of inquiry. A pyramid of pulpwood (the only exhibit of the kind at the fair), was erected in the centre of this building rising to a height of 25 feet. Set into this pyramid were panels showing the different stages in the manufacture of pulp, first the chips, then the coarse pulp reduced by acids from the chips, and lastly the pulp rolled into sheets. In the general exhibit were sections of the Douglas fir from the Pacific coast, sections of the great oak, elms, pines, cedars, maples, birch, ash, walnut, hickory, basswood and every other variety of timber grown and used for manufacturing purposes in Canada. Besides shown in rough sections, all of these varieties of timber were exhibited in squared sections, in rough lumber, and lumber with surface planed and polished. In addition to this a great variety of worked and bent wood was shown, such as tool handles, sash, doors, and articles in which bent wood is used.

This exhibit, like several of the others, was plentifully supplied with panels giving information regarding the extent of the timber and pulpwood areas of Canada, the annual output of each article, its annual consumption, &c., and came in for a full share of grand prizes and other awards.

GENERAL REMARKS.

It might be mentioned that in the installation of the Canadian exhibits at St. Louis, every advantage was taken of the facilities at Ottawa, where a workshop came in very useful in the preparation of some of the fixtures, stands and wooden structures that were used. This effected a considerable saving in time and money, and gave employment to Canadian skill and labour, and to that extent expended some of the appropriation at home.

To fully appreciate this point, it would be necessary to know something of the labour conditions of St. Louis. We found the regulations among the labour unions there very arbitrary and vexatious. Unlike the union men in Canada, in St. Louis they religiously abstained from working on a Saturday afternoon, but would work all day Sunday at a double day's wages, and demand the same rate for every hour over eight hours a day on all other days. The large contractors had nearly all the skilled and efficient workmen bonused to stay with them, and that left all the lesser contracts dependent upon a class of unskilled and incapable men, who the labour demand enabled to rush in and join the unions and demand the same rate of wages paid to the skilled workmen. This condition of affairs greatly retarded the work of construction and installation besides adding greatly to its cost.

To this condition of affairs there was but one alternative if the work was to proceed, and that was to offer a bonus in increased wages to skilled workmen as the large contractors were doing. To this alternative we were compelled to resort, otherwise we could not have had our installation completed in time for the opening of the fair.

The rate of wages demanded and paid was something, as follows :—For a skilled mechanic or carpenter, 65 cents per hour; ordinary carpenter, 60 cents per hour, just double those rates for Sunday and extra hours on week days. Bonused mechanics got 70 cents and 75 cents per hour, doubling on Sunday and extra hours.

Attractive literature descriptive of Canada and of the different exhibits was distributed from the various spaces occupied, and also from the Canadian pavilion. Over 500,000 pieces were distributed in this way, but so great was the demand that the supply was exhausted more than a month before the close of the exposition. It is worthy to note that students and school teachers were particularly desirous of obtaining any matter descriptive of Canada, and we have information that in more than one case the pamphlets were used as text-books by teachers among the students in the schools.

The newspapers of the country were very liberal and flattering in their comments about Canada and her exhibits. From clippings which we were able to gather we feel justified in saying that Canada received more free newspaper advertising in connection with her exhibits than any other state or country officially represented at the exposition.

In conclusion I beg to acknowledge the courtesies extended by the officials of the exposition and all those with whom we came in contact in an unofficial way during our residence in St. Louis. I also wish to give expression of my thanks to the staff of the Canadian Commission, all of whom performed their respective duties in a most competent manner.

Respectfully submitted,

WM. HUTCHISON,
Commissioner, Exhibition Branch.

St. Louis, Missouri,
November 15, 1904.

INDEX TO APPENDICES.